THE INDEPENDENT GUIDE TO **IBM** PERSONAL COMPUTERS

PC

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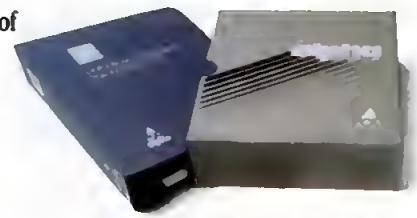

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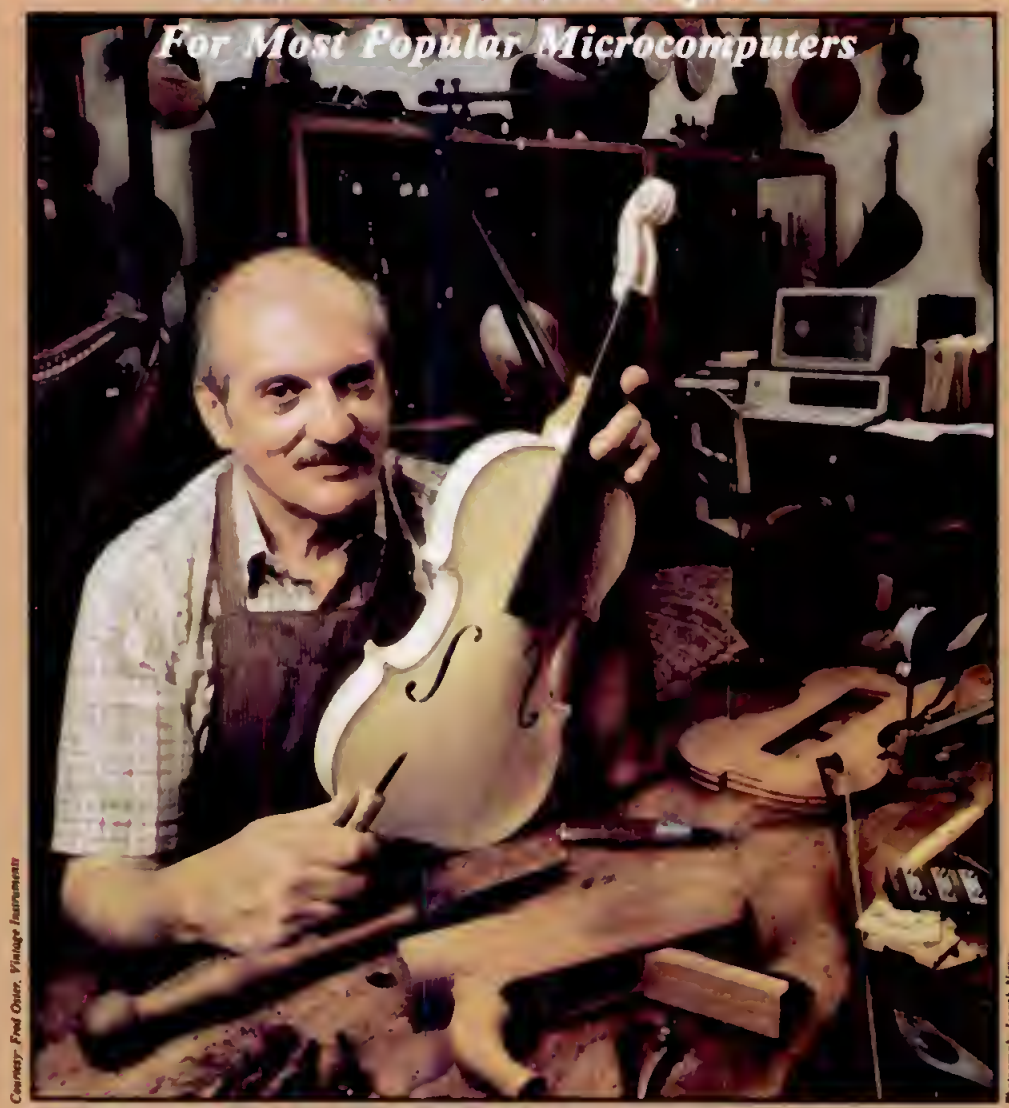

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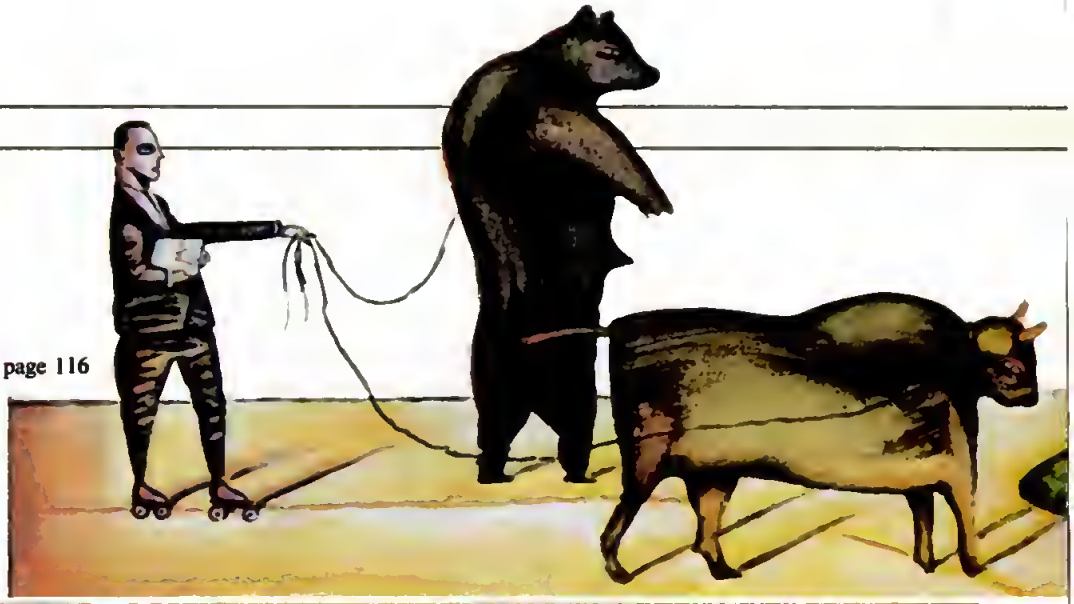

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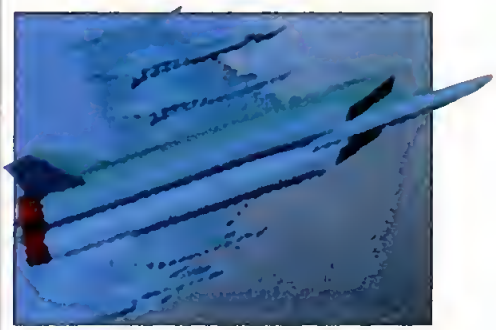

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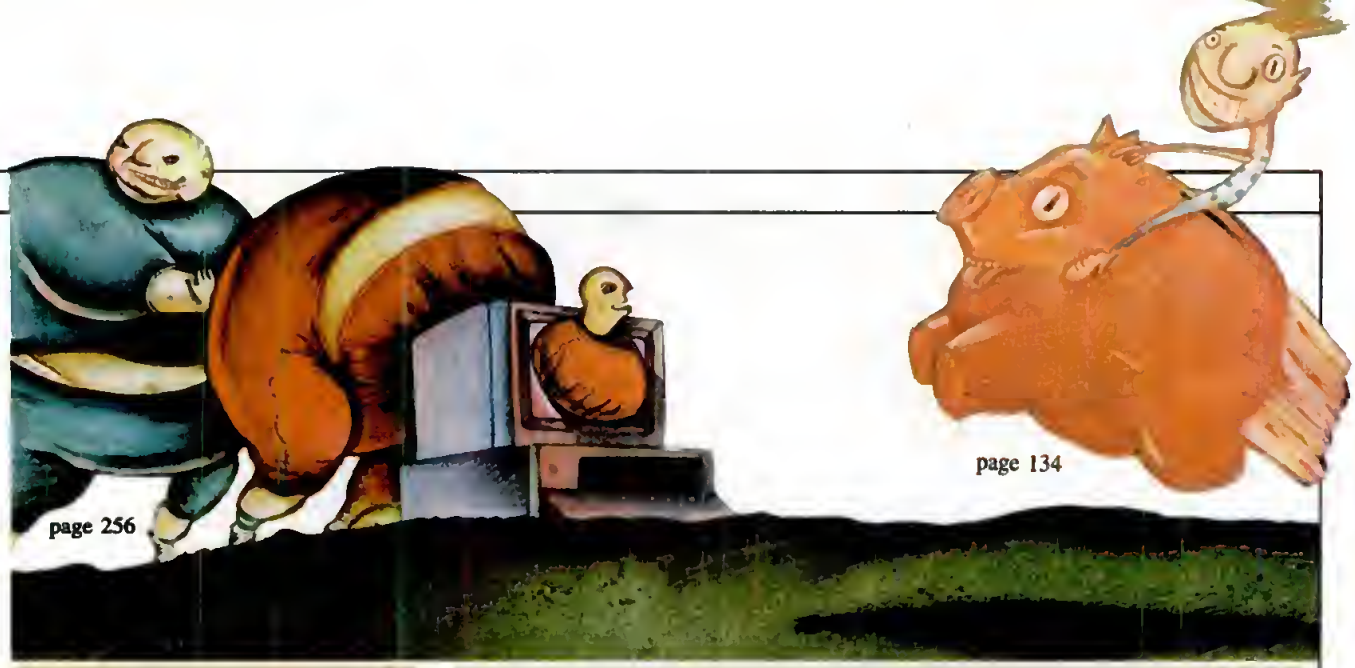

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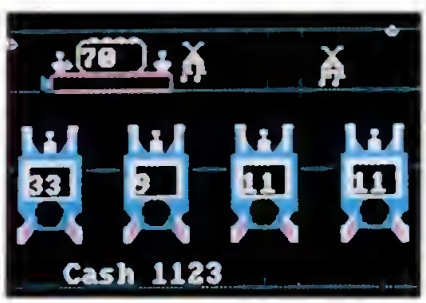

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Reviewer, SOFTALK
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Sherry Knight, CPA
PC Magazine, February, 1983

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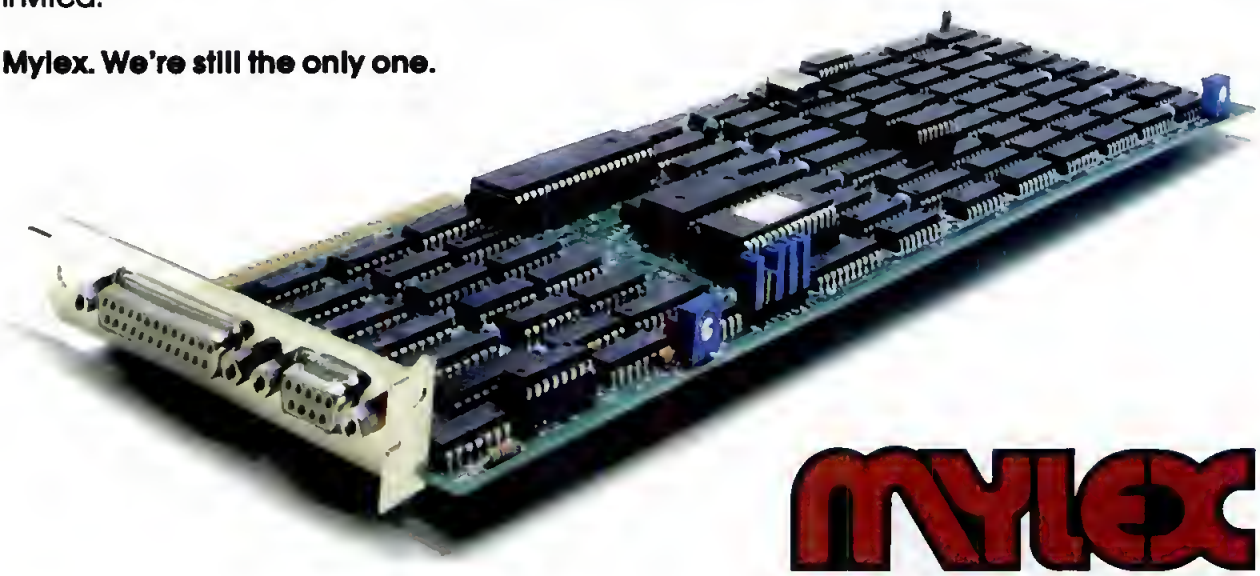

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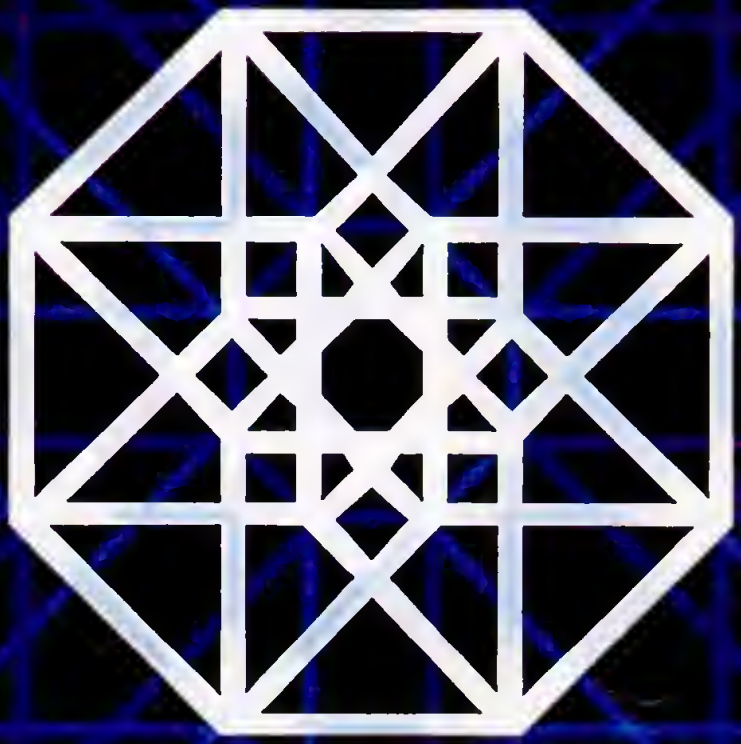

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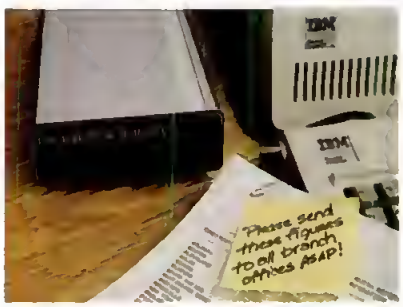

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2. Quad3278™ Let an IBM PC communicate with an IBM mainframe.

To integrate your PC into a mainframe environment, look to Quadram first.

Because now you can have all the features of the IBM PC (mass storage and peripherals) plus the incredible power of a mainframe right at your desk. All it takes is Quadram's 3278 emulation package which includes hardware, software, even cabling.

To make your IBM PC emulate the 3278 Display Work Station, get the Quad3278.™

Once you're on-line the IBM mainframe sees you as just another 3278 terminal. Little does it know that you're actually a high-performance, intelligent work station, with all the functions of the Personal Computer. With mainframe support you can download data, process it on your PC, even store it on your own disk for later reference.

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3. Quadnet.™ Turns your IBM PC's into a Local Area Network.

Local Area Networking (LAN) is one of the most interesting and useful ideas to come down the pike. Basically, it allows you to inter-link a group of computers together so they can share information and peripherals with each other.

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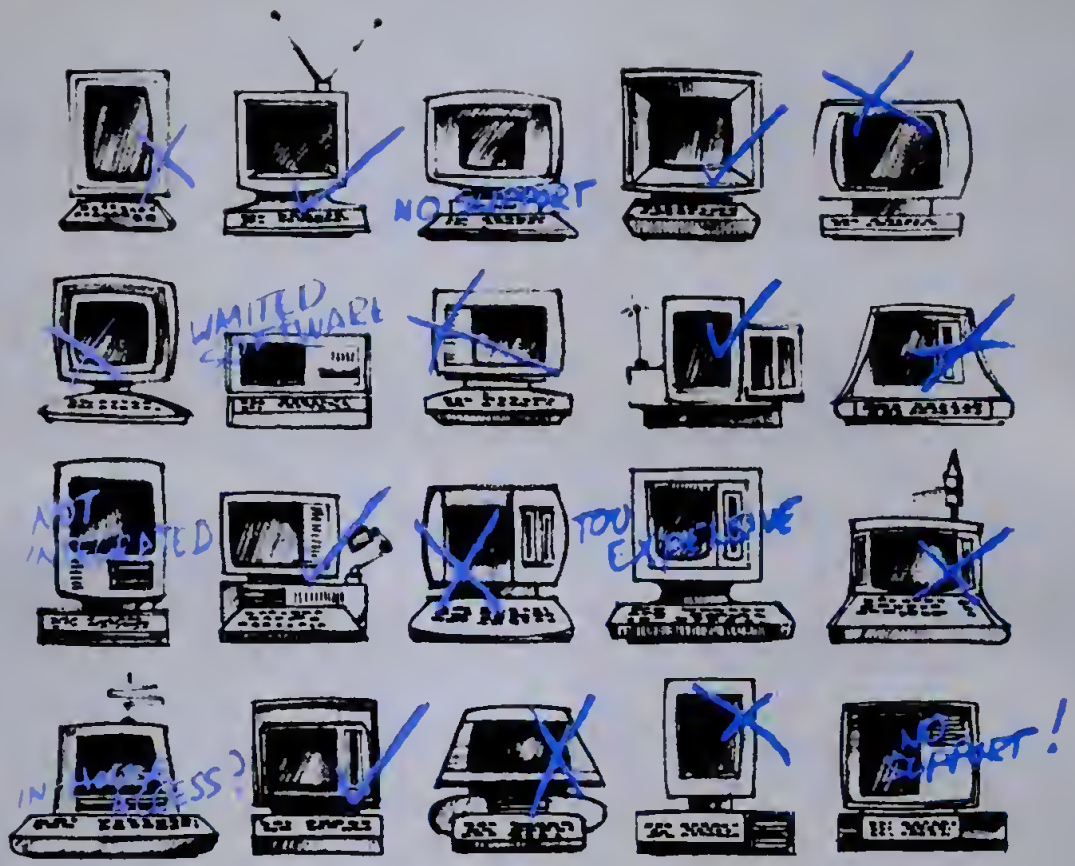

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The Independent Guide to IBM Personal Computers

What's Inside

We wanted Scrooge McDuck on our cover, but we didn't want to sell out to Walt Disney Productions. Not to worry—it's only a bedtime story with a happy ending.

Executive editor Mike Edelhart came to me today and said that enough was enough.

"Every time you write 'What's Inside,' " he said sternly, "you complain about something. If it's not problems with getting review material, then it's problems with the authors, or problems with the software—you've even written a column about problems writing the column! This has got to stop!"

I tried to look properly abashed. "What do you want? A bedtime story?"

"Don't be snide," he said, not in the least impressed. "Just go and give me something cheerful."

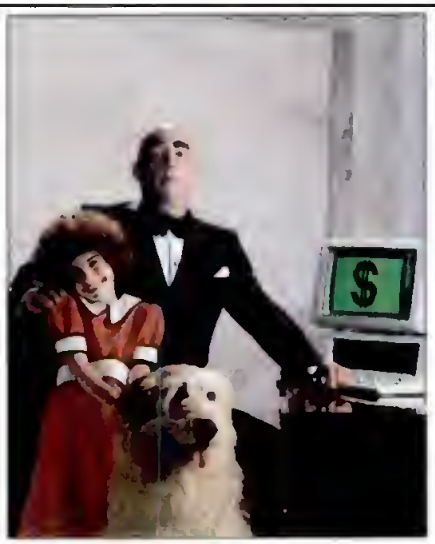
Once upon a time there was a handy-dandy magazine called *PC*. *PC* covered everything that anyone wanted to know about the IBM Personal Computer and its many, many related products.

Most of the time, the people who worked at *PC* were very happy, and the offices were filled with song and laughter. On this particular day, though, they were very sad indeed.

A Duck on the Cover?

Why? Because Scrooge McDuck was not going to be on the cover of this issue.

I'm sure that most of you must know who Scrooge McDuck is. He is the ultimate capitalist, as created by Walt Disney.



Photograph: Dennis Chalker

And he seemed like the perfect spokesfowl for the cover package on the PC as a tool for personal investment.

PC's editors first conceived the idea for this package at a recent Softcon. Many interesting products in the personal investment line were showing up. At about the same time, friends in Wall Street were approaching staff members and complaining that their clients who use PCs and investment software are party to as much information as the advisors themselves. "It's cutting into our commissions!" the brokers wept.

PC's editors comforted the brokers, showed them out of the offices, and thought deeply. If PC owners could use their microcomputers to do what they used to pay experts to do, shouldn't the editors let their readers in on it?

Coincidentally, executive editor Mike Edelhart received a letter from Nick Maffei, who is marketing manager of a large American corporation. Maffei had used his PC for tracking his financial resources and rental properties and was amazed at its effectiveness. He suggested that *PC Magazine* spread the word. Edelhart thought that was a wonderful idea—and asked Maffei to write it up.

At the same time (who said there were no such things as fairy godmothers?), George Hayles sent a note up from Atlanta. "I've got an article on stock market tracking systems for PC owners," he wrote. "I'd like to tell your readers how they can get the same information as their brokers on stock performances."

This sounded like a fine idea to the *PC* editors, who encouraged Hayles to go right ahead. But they didn't reckon on the tenacity of the man. Hayles was so taken with his subject that he sent in the article early, called the editors, and offered to put together another article on on-line database manipulation products. Of course, the grateful *PC* staff had absolutely no objections whatsoever.

In order to round out the package, *PC*'s editors had Eric Freedman look at a couple

of personal financial management systems. They also included the third part of *PC*'s comprehensive series on database products and assigned Bill Harts to take the first glimpse of the new IBM computer.

"So," I hear you cry, "what does all this have to do with not having Scrooge McDuck on the cover?"

Well, we gave it our best, but Walt Disney Productions was adamant—the only place where that domineering drake could appear as a cover illustration was on Disney Products. We had to find another way to present our cover stories, or sell the magazine to Disney.

And can you imagine what would happen then?

The magazine would open with 101 software manufacturers, their databases slung over their shoulders, trooping to work through the caverns of Silicon Valley singing, "Hi ho, hi ho, it's on to disk we go. . . ."

They would arrive at their climate-controlled cottage and find an IBM PC 3270 that has found its way through the microcomputer forest and is now busily computing their net worth for the year 1983.

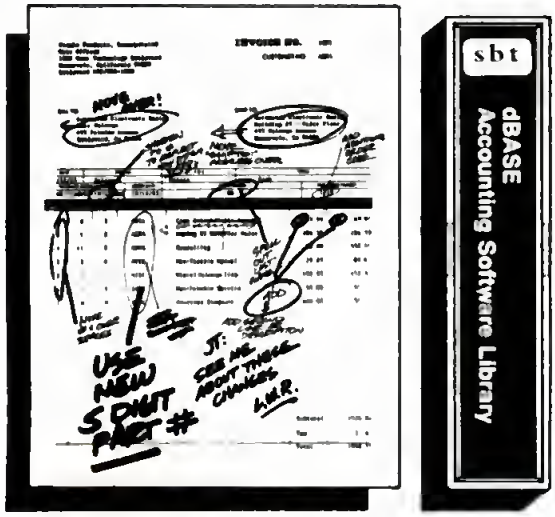
As the manufacturers debate whether or not to adopt the 3270, who should come knocking at the door but the wicked stepmother who, cackling madly, offers the software manufacturers a Macintosh Apple. Will the manufacturers bite the Apple? Will the 3270 turn out to be a sleeping beauty or a dead duck?

Meanwhile, at the top of a Wall Street castle, a lovely little PC is singing, "Someday my printer will come. . . ." All the mainframe and minicomputers have gone to the Fortune 500 ball, and she is left all alone. Suddenly, a fairy godmotherboard appears, waves its magic wand, and transforms the little PC into a viable investment tool. Will the upgraded PC make a hit at the financial ball? Or will it turn into a pumpkin?

As you can see, we didn't sell out to Disney. However, like all good bedtime stories, this one has a happy ending. Although we had to do without McDuck, art director Mitch Shostak and the rest of the art department worked a little magic and came up with the present, most satisfactory cover.

So song and laughter once again came to One Park Avenue, and they all lived happily ever after. Aren't cheerful endings nice? ■

SOURCE CODE INCLUDED...



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READ ONLY

A review of the IBM Personal Computer family. Summer 1984

UP AND RUNNING

And Swimming, Building, and Baking. Building and baking? They don't produce gold medal winners, but they do figure in staging the Olympic games. So do 200 IBM Personal Computers (including software) that are part of IBM's sponsorship of the 1984 Olympics in Los Angeles. In fact, IBM PCs are hard at work in both sports and administration.

PCs are involved in a wide range of planning and analytical activities, though they don't provide official results of the various athletic events. Some events, for example, use the IBM PC to determine how competitors are seeded—who competes against whom. In other events, such as archery, the PC simplifies the complex task of recording scores and compiling statistics for each athlete as the competition progresses.

In events like gymnastics that depend on points awarded by judges, statistics can he kept on the PCs to analyze scoring consistency. Also, a whole range of information about individual athletes, past Olympics, and world and national records, both past and present, can be quickly recalled and compared with the help of the IBM PC.

Last but not least, administration. Spreadsheet programs, such as IBM's Multiplan™, were used on the PC for planning and forecasting by nearly every administrative department, from Construction to Ticketing. The same departments speed up some of their day-to-day accounting tasks with the help of the PC and IBM accounting packages.

Departments with specific software needs developed special packages with the assistance of a programmer whose services are part of IBM's Olympic sponsorship. Specially designed programs include database management applications to help handle transportation requirements and inventory control programs to keep track of sports equipment and personnel records.

In short, there's hardly an area of planning and staging the 1984 Summer Olympics that the IBM Personal Computer doesn't play a part in. Maybe there *should* be medals for administration.

Multiplan is a U.S. trademark of Microsoft Corporation

ON THE STOREFRONT

A Shorter Distance between PC Points. We're all familiar with the feeling of being lost in the growing maze of new computer products. IBM has opened a path through that maze, straight to the information and answers you need about IBM Personal Computer Products—information about a specific software package or hardware configuration and answers to technical questions.

The key to entering this new information path is the IBM Customer Support System (CSS) at your authorized IBM Personal Computer retail dealer or IBM Product Center. Dealers in over 300 cities throughout all 50 states use the Customer Support System, which includes a nationwide communications network, to help give you instantaneous computer-age service support that's unmatched by any other computer manufacturer.

Colorful Stops along the Way. More than 1,700 authorized IBM dealers have access to a permanent and continually updated directory of IBM Personal Computer product information in IBM's Customer Support System. For a sharp color display of the type and level of information you want, visit your dealer or IBM Product Center and choose from lists of options displayed on an IBM PC color monitor. There are choices that guide you quickly and easily from product directories to in-depth product demonstrations and configuration information.

Since knowing how to take the first step is often a problem, CSS gives you a variety of possible starting points. By selecting the appropriate category—such as printers or business software—you can move to a list of specific products and then to the

Information from CSS with simple one-key commands

product demonstration you want. If you know a product name to begin with—Word Proof, for example—CSS will make an alphabetic search for it. To keep you up-to-date, there's also a special listing for new product announcements.

You can browse through the CSS displays at your own pace, pausing at a given spot or moving quickly backward or forward by using simple one-key commands that are always displayed at the bottom of the screen. One of these commands enables you to make print-outs of any information you wish to save for future reference.

The IBM PC family's color graphics capabilities make the CSS software demonstrations especially impressive. The Multiplan demonstration, for example, consists of several consecutive screens of information. Each screen is split vertically, with representative sections of the actual program on the left and explanatory text on the right. By the time you've seen the entire demonstration, you'll have a good idea of both *what* the program can do for you and *how* it does it.

Answers at the End of the Line. Over 1,000 authorized IBM retail dealers and IBM Product Centers are linked through their Customer Support System to the IBM Information Network. This nationwide communications capability helps your dealer give you fast, efficient service. Warranty claims, for instance, can be handled through CSS with a minimum of paperwork and delay. Dealers also use the network to communicate with other dealers and with IBM to keep abreast of the latest product and service information.

In addition, the CSS network is your gateway to technical information about the IBM Personal Computer family of products. IBM maintains a database on a 3033 mainframe in Tampa, Florida, that your dealer can use to answer—within minutes—a wide range of questions. If the solution isn't on hand in the database, your question can be submitted through CSS to a technical support staff in Boca Raton. There, it will be analyzed and an answer returned through CSS to your dealer.

The information used to answer your inquiry is added to the CSS database, where it will be immediately available for anyone else with a similar question. Your technical inquiries therefore contribute to the growth of the Customer Support System. Its online product information, color graphics displays, and advanced communications all have a single purpose—to help you get the most out of your investment in IBM Personal Computer hardware and software products.

HARDWARE NEWS

Color. There's color news for the IBM PC, IBM PC XT, and IBM *Portable* PC in the form of the IBM Personal Computer Color Printer. It's a high-performance, dot matrix printer that can print charts, graphics, artwork, and text in up to eight colors. The Color Printer produces color graphics that can enhance the appearance of your reports and presentations and make the information they contain even easier to understand. It can also type directly onto overhead transparencies.

The IBM PC Color Printer's range of performance features make it especially well suited for heavy-use/high-productivity applications. A near letter quality printing mode is standard. Printing speeds of up to 200 characters per second can help save time. So can programmable automatic control of print requirements such as print mode, line spacing, and margin and tab setting. These programmable features act as an extension of many software products—word processing programs, for instance—and can be initiated with just a few keystrokes.

A final feature for those who like a personal touch. You can use the Color Printer to personalize your documents by varying the printing modes, character spacing, and boldness. This allows you to differentiate

The IBM PC Color Printer

among headlines, subheads, and quotations and even to print math and science equations.

The Big Crunch. Not long ago, computing and number crunching were nearly synonymous. Personal computers and software for everything from office management to agriculture changed that, but the need for heavy number crunching has hardly disappeared. If it's still a part of your computer workload, the IBM Personal Computer 8087 Math Co-processor can help speed up your calculations.

The 8087 is a floating point co-processor that multiplies, divides, adds, subtracts, exponentiates, and performs trigonometric and logarithmic functions. It works together with the PC's 8088 processor to improve the execution speed of floating point operations by as much as 10:1. The Math Co-processor increases calculation speeds so greatly because it makes floating point operations a hardware rather than a software function.

In addition to increasing the speed—and often the level of precision—of statistical and analytical math packages, the Math Co-processor can improve the display speed of graphics and video games. It also significantly improves high-level language execution time, and is designed to work with the APL Interpreter and the version 2.0 Pascal and FORTRAN Compilers discussed next in this issue.

WHAT'S THE PROGRAM

We Speak Your Language. IBM Personal Computers are shameless polyglots. They can handle most of the popular programming languages you want to work with. Much of the credit for their versatility goes to the IBM Disk Operating System (DOS) 2.10. This updated version of DOS 2.00 was developed to provide support for the IBM PCjr as well as for the IBM PC, PC XT, and IBM *Portable* PC. So all members of the IBM Personal Computer family are united by a single master program that provides the required support between their hardware and a wide range of application programs.

More to our present linguistic point, the DOS 2.10 diskette contains two programs, Disk BASIC and Advanced BASIC, to help you write your own programs on an IBM PC. (IBM PCjr BASIC—a separate, optional cartridge—provides this support for the PCjr.) Disk BASIC adds DOS file support, date, time of day, and communications capabilities to the BASIC language that comes with every personal computer from IBM. Advanced BASIC adds advanced key trapping and advanced graphics—including viewports, windows, and paint tiling—plus music and other capabilities.

DOS has other features that help simplify advanced program development and design, including a line editor, a linker, background printing, and chaining of commands. For help with writing and editing particularly sophisticated BASIC programs, there's the BASIC Programming Development System, a software package that consists of two programs and four utilities. The first program includes a Text File Editor and a Structured BASIC Pre-processor; the second includes a BASIC Formatter and a BASIC Cross-Reference.

Native Translators Available. The IBM BASIC Compiler compiles or translates the BASIC programs you've written, down to native object code so they'll run on your IBM PC. And BASIC is just the beginning. DOS also provides the support you need to develop and run programs using the IBM Personal Computer Macro Assembler or the FORTRAN, COBOL, and Pascal Compilers.*

Two of these, the FORTRAN and Pascal Compilers, are available in recently updated versions. IBM PC Pascal 2.0 is based on the ISO standard, and IBM PC FORTRAN 2.0 conforms to the ANSI-77 standard subset level. Both new versions feature improved arithmetic capabilities, and both support the IBM 8087 Math Co-processor for greatly increased speed in processing floating point calculations. (For more about the Math Co-processor, see "Hardware News" in this issue of *Read Only*.)

In addition, versions 2.0 of the FORTRAN and Pascal Compilers feature a Library Manager for creating user-defined libraries and provide easy access to all files in any subdirectory through DOS path support. FORTRAN 2.0 supports linking of object modules with subroutines written in Pascal 2.0 and vice versa. Both new versions support linking of object modules with subroutines written in IBM PC Macro Assembler.

There's a bargain in store for those who already own the 1.0 versions of these compilers: you have the option of buying an upgrade to the 2.0 version at a substantial savings from the full 2.0 price.

To ensure that your programming reach doesn't exceed your grasp, the IBM PC APL Interpreter enables you to write and edit your own programs in APL. It can also be used to exchange data files and workspace between your IBM PC and many mainframe computers.*

Finally, if you're inclined to make serious use of the IBM PC's array of programming aids, we suggest that you also take a look at the recently announced IBM PC Sort program. It provides support for data types and file organizations used by the IBM DOS-supported languages mentioned

Application development tools from IBM

above and can significantly speed and streamline your programming efforts.

IBM PC Sort can be used as a stand-alone utility, integrated into a batch job stream, or invoked directly from a COBOL program via the Sort verb. It can sort records from a data file or files, merge multiple input files, selectively include or exclude records, and create an output file containing the records, pointers, or keys from the input files. There are no arbitrary limits in IBM PC Sort for file size, record length, number of keys, or number of input files.

*BASIC Compiler and Macro Assembler will run on the IBM PCjr. APL Interpreter will not. Although the IBM PCjr does not support FORTRAN, COBOL, and Pascal Compilers, most of their output will run on the PCjr if there is sufficient storage.

Now Get Organized. The IBM PC's ability to run a wide variety of commercially available programs and to help you develop your own applications may result in a good news/bad news situation. The good news is that you'll be able to satisfy your application requirements. The bad news is that you'll probably be the one responsible for keeping track of your growing library of programs. If, as we've often found, enthusiasm outstrips organization, you may find yourself falling behind—especially if you're working in an area, such as

Animation Creation software from IBM

small business finance or education, where programs multiply rapidly.

Fortunately, help is in sight, in the form of Fixed Disk Organizer, an IBM software package that does just what its name suggests.

Fixed Disk Organizer has a master menu that lets you sort out your various application programs by category—word processing, spreadsheet, communications, and so on. You can tailor the menu to your specific application needs by adding new menu categories, revising or deleting existing categories, or changing titles. The master menu allows you to review all the programs stored on your fixed disk at a glance and to call them up quickly with just a couple of keystrokes.

Fixed Disk Organizer also helps protect sensitive data by allowing you to create passwords and restrict access. It also enables you to write a

string of complex DOS commands into a batch file and execute them whenever you want simply by selecting that file from the menu. And in case part of your organizational problems stem from not always remembering just how things are organized, you can use Fixed Disk Organizer to establish Help files as a reminder.

So we're all in trouble—no more excuses for not being organized.

Moving Pictures and Mathematical Castles. Let's not forget that there's more to life than programming, compiling, and getting organized. There's also software from IBM for pure enjoyment and for enjoyable education. Two such packages are Animation Creation and Adventures in Math.

Adventures in Math incorporates math drills into an adventure game with vivid color graphics of a castle and its passageways and treasures. To find the way out—and to uncover as many treasures as possible along the way—children (or particularly skillful adults) have to solve basic math problems. The program's difficulty level increases as you solve the problems you're confronted with.

Using Animation Creation, you or your children can draw your own pictures and watch them come to life. To draw pictures, you select from 254 computer characters and position them on your screen. Add color by choosing any of 16 foreground and 8 background colors. Then, by slightly repositioning the images on successive screens, you can create animation.

Next stop, Hollywood.

HARDCOPY

You Can't Enjoy the Game without a Program. Earlier in this issue (see "On the Storefront"), we discussed the Customer Support System for online information about IBM Personal Computer products. Much of that information is also available in two publications: *The Guide*, a directory of Personal Computer offerings from IBM, and *The Library*, a directory of IBM Personal Computer software offerings. If you want to enjoy the personal computer game, these are the "programs" you need to do it.

The Guide, published twice a year, is a catalog that contains clear, concise descriptions of IBM PC, IBM PC XT, IBM PCjr, and IBM *Portable* PC systems. It also reviews printers, video displays, expansion units, and all other IBM PC hardware products. A separate section of *The Guide* contains articles on IBM PC software packages.

Both hardware and software articles are illustrated

with annotated color photographs—of key screens for the software packages—and start with charts that provide quick product overviews. Other noteworthy features include sample configuration tables for all three systems and a closing section on Sales and Service Support.

The Library, updated quarterly, presents an overview in booklet form of the entire IBM PC software product line. It presents the software by category, with sections on Operating Systems and Languages, Personal Productivity, Communications, Business, Education, and Entertainment. Program descriptions are brief and to the point. Each includes a short overview, program highlights, and system requirements. There's also a chart at the end of the booklet that shows at a glance which programs are compatible with the IBM PCjr.

Or the Hardware without a Manual. If *The Guide* and *The Library* are the general road maps to IBM PC products, the *Technical Reference* and *Hardware Maintenance and Service* manuals*—now available in newly updated versions—are the detailed maps of downtown. It's not a trip everyone wants to take, but if you do, these are the right directions.

There's a three-volume *Technical Reference* set for the PC and another for the PC XT and *Portable* PC. These manuals include the functional specifications for the system units and for the options and adaptors in the IBM PC product line. The *Hardware Maintenance and Service* manual details many aspects of troubleshooting a personal computer from IBM. It includes a parts catalog, a section on preventive maintenance, and instructions for identifying the failure of a replacement unit.

*These manuals are intended for use by technically qualified service personnel.

TIPS AND TECHNIQUES

If you use Personal Editor—IBM's full-screen editor for writing programs and brief documents—but find yourself displaying the Help file whenever you forget a function key assignment, here's a little help from the fellow forgetful.

Function key assignments can easily be displayed on the command line of your Personal Editor screen by assigning F1 to display the unmodified keys and alt+F1 to display the alt+Fx keys. You can then assign the Help function to alt+H, although you probably won't need it nearly as often as before.

The macro for the F1 assignment can be written as follows: def f1 = [cursor command[[begin line] 'F: 2=Save 3=File 4=Quit 5=Erase 6=EraseEOL 7=Print 8=Switch 9=InsL 10=Ins&Indt' [cursor data].

IBM®

For more information about IBM Personal Computer products, see your authorized IBM Personal Computer dealer or IBM Product Center. To learn where, call 800-447-4700. In Alaska and Hawaii, 800-447-0890.

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☐ VisiCalc
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VCN EXECUVISION™

The Presentation Graphics Program™ from Prentice-Hall, Inc.

How you present your message is just as important as *what you present* in today's competitive environment. That's why so many executives, managers, salespeople, and professionals in every field, from doctors to attorneys...teachers to architects are relying more and more on visual presentations to convey their complex ideas and information.

Now there is an incredibly advanced software program that will allow you to create professional quality graphic presentations right on your IBM PC or IBM XT. VCN ExecuVision, from the Business and Professional Division of Prentice-Hall, brings the power of a complete graphic arts department to your computer. *In minutes*, you can create exciting presentations that previously would have taken days, or weeks, for an art department to complete. Presentations that you can run directly on your computer monitor or with an overhead projection screen...or convert to hard copy or slides.

VCN ExecuVision is the ideal tool for meetings, new business proposals, consulting symposia, educational/training programs, marketing plans, management reports, or virtually any other professional presentation.

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- Images from all over the world are at your fingertips in the *International Symbols & Landmarks Collection.*
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Each library contains both full screen images and partial screens (pixes). You can use the entire image, or, with the electronic CUT AND PASTE program function, use just a detail from the full screen. You can modify or enhance these images, mix and match them, choose from 64 possible color combinations... you can even set the images in motion across the screen using VCN ExecuVision's animation functions.

With the program's sketching capabilities, you can create your own visual images! For your text, choose from 100 different type styles, from bold to italic, plain to fancy.

Best of all, you don't have to be an artist to use VCN ExecuVision successfully. Every function is offered in a series of easy to follow menus. VCN ExecuVision also comes with a tutorial disk and an extremely easy-to-follow full-color manual that will take you step by step through the program.

VCN ExecuVision can immediately be put to use making all of your information and ideas—*and you!*—look sharper, more prepared, and more professional.

For a demonstration of VCN ExecuVision, visit your nearest computer software dealer. For more information, call toll-free 800-624-0023 (NJ residents call 800-624-0024), or return the coupon on the facing page.

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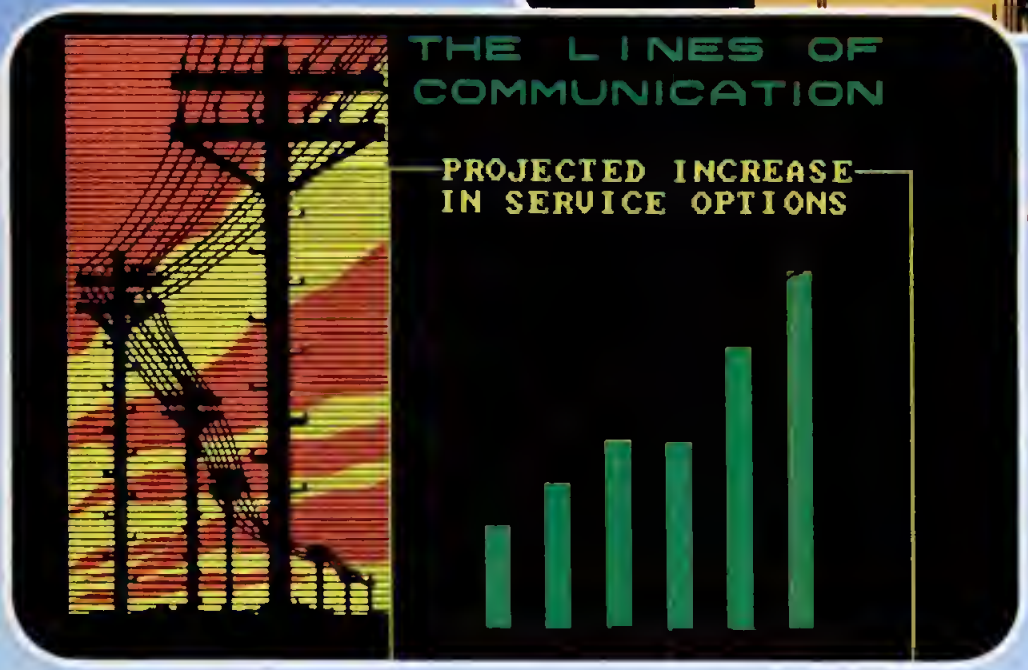

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An Industry First in Word Processing Software:

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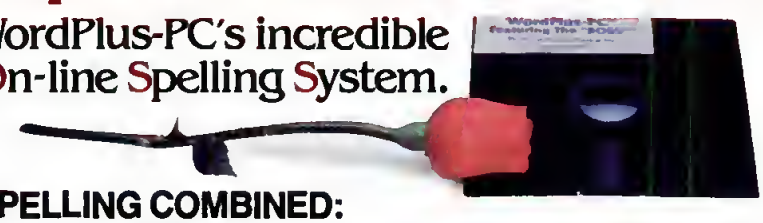


WORD PROCESSING AND SPELLING COMBINED:

WordPlus-PC featuring the "BOSS" is a whole new technology in word processing software. Finally, the most powerful word processing capabilities have been combined with a built-in electronic spelling system which not only *checks your spelling* but also *corrects your spelling.*

The "BOSS", an acronym for Built-in On-line Spelling System, eliminates embarrassing spelling errors in your letters and stops time consuming trips to the dictionary.

But WordPlus-PC featuring The "BOSS" will do far more than just check and correct your spelling. It's been designed to be exceptionally easy to use and yet contain all the powerful features you expect and more. Like built-in mail merge for personalized form letters, invoice generation and the ability to merge information created by most other popular programs such as 1-2-3™ and dBASE II.™ And if you have a question, just press the HELP key to get back on track.

You can also print bar graphs and other charts,** easily move columns, scroll horizontally, execute global search and replace, boilerplate text, and even print proportionally spaced on selected printers. And WordPlus-PC is compatible with virtually all popular letter-quality and dot matrix printers.

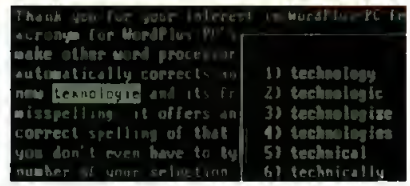
*With 90,000+ word standard dictionary and ability for a user to add over 10,000 "custom" words.

HERE'S HOW THE BOSS WORKS FOR YOU:

IT CHECKS

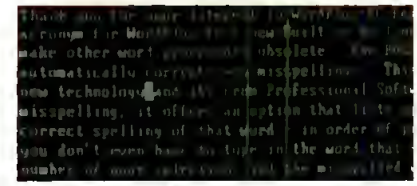
At the touch of a button, virtually anytime during typing or after the creation of a document, The "BOSS" locates and *highlights misspelled words* on your screen. The "BOSS" can even check the spelling of a word directly after it's been typed in.

IT SUGGESTS



When a word is misspelled, the user can ask The "BOSS" for suggestions as to how to correctly spell the word. With only one keystroke, The "BOSS" will display, in a dynamic on-screen window, up to eight *spelling suggestions in the order of probable phonetic correctness.*

IT CORRECTS



And The "BOSS" *Auto Correct* feature enables users to "fix" these misspelled words directly in text with a single keystroke. The "BOSS" is a total spelling system that Checks, Suggests, and Corrects your Spelling. All built-in.

THE TOTAL WORD PROCESSING SOLUTION — PLUS ALL THE HELP YOU'LL NEED.

With over 70,000 word processors in use worldwide, Professional Software, Inc. has designed WordPlus-PC to contain all the powerful features you expect — and to be the easiest word processor to use anywhere. But there will always be questions. That's why Professional Software has an entire bank of Nation-wide TOLL FREE customer HELP lines to support our registered users. This service is available at No Charge during the 90 days following the receipt of your registered users card.

Demand to see the BOSS in person
Visit your local professional computer dealer or call us toll free for the dealer nearest you. Once you witness the BOSS in action, you'll see that all other word processors have become totally obsolete.

Demand to see the "BOSS" today! Call us toll free, 1-800-343-4074.

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Specifications are subject to change without notice.

WordPlus-PC was designed and written by Andres Escallon.
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Let your fingers do the filing...

With DataPlus-PC™

Using DataPlus-PC, all your important last minute information is literally at the tips of your fingers. Incredibly fast and refreshingly easy to learn and use, DataPlus-PC transforms your personal computer into a powerful "electronic filing and report system" which allows you to perform a wide range of sophisticated database functions normally found in programs costing hundreds of dollars more.

Unlike other databases which require hours upon hours of "setup" time, DataPlus-PC has been carefully designed to allow even novice users to begin using it in a matter of minutes. DataPlus-PC incorporates the latest state of the art technology including a completely Menu Driven system which communicates with you in easy to understand English.

The unique **Super Scan™** function gives you the ability to search for and display any information record in seconds, providing you with almost instantaneous access to your important information. And DataPlus-PC's powerful **MLG™** (Mailing Label Generator) makes the designing and printing of time consuming mass mailings a breeze. In addition, DataPlus-PC's built-in **Report Generator** provides powerful mathematical capabilities and allows you to produce customized reports just the way you want them, when you want them. And with DataPlus-PC's integrated **Memo Window™** facility, you'll have a handy "extra text" area which allows you to include remarks, extra notes, client summaries, or other valuable information related to each record.

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Don't settle for less than the best. Ask for DataPlus-PC at your local computer dealer or call us today for the dealer nearest you — and "let your fingers do the filing." DataPlus-PC is available from dealers nationwide, with a suggested retail price of $250.

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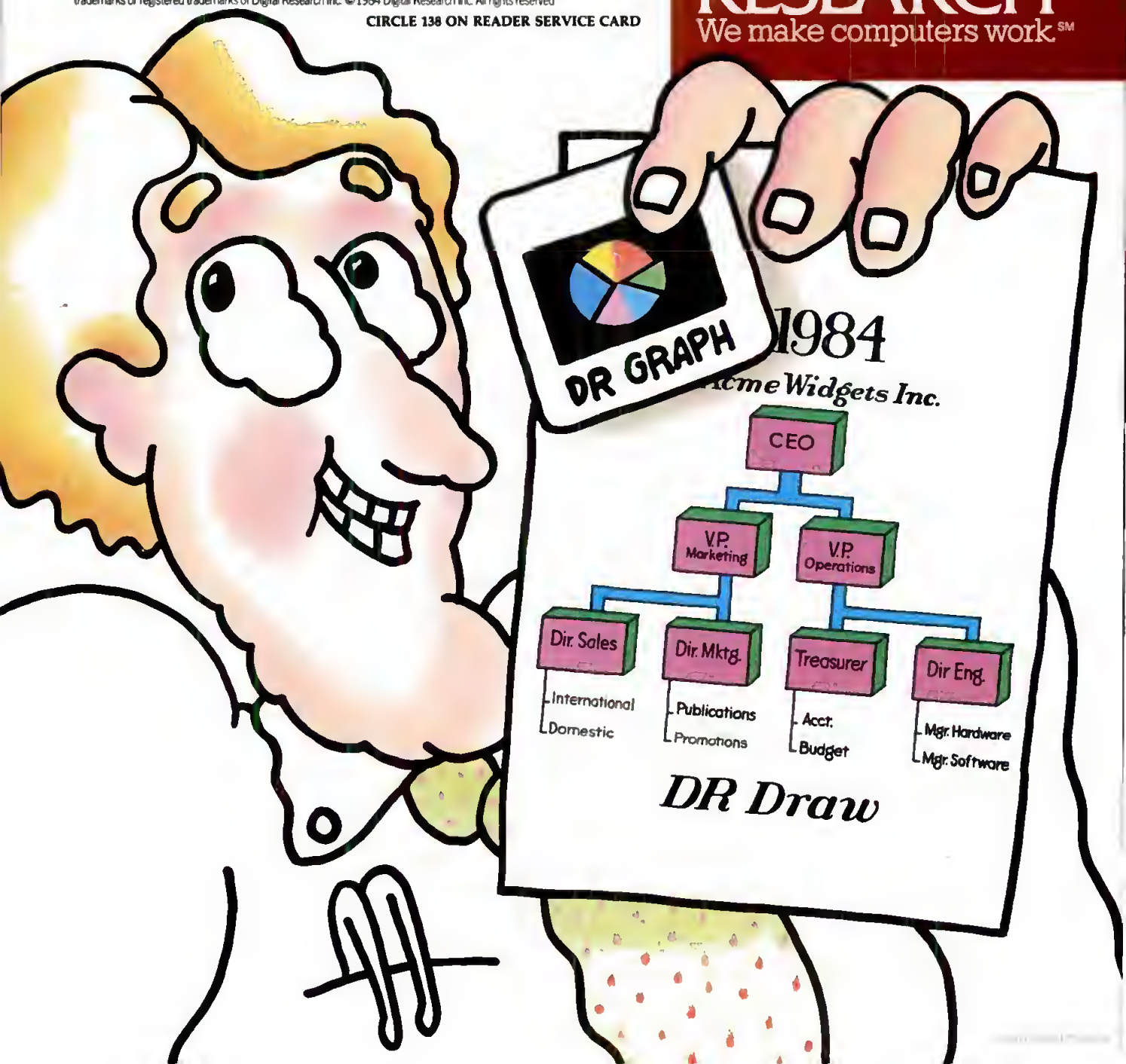


★★★★ EXTRA ★★★★

FOX & GELLER SHIPS OZ!

ADVERTISEMENT

OZ DOES FOR MANAGERS WHAT SPREADSHEETS CAN'T

Elmwood Park, N.J.—Fox & Geller today announced the shipping of OZ, their new stand-alone financial management software.

OZ is designed to do what managers have been trying to do with spreadsheets all along.

OZ can work with spreadsheet files or its own data files to perform managerial functians like: Organizational consolidation, Profit & Loss analysis, 3-dimensional financial analysis, built-in financial reports plus complete color graphics capability. Most of these functions are performed with a single keystroke.

Fox & Geller boast of a unique Budget Variance Analysis feature in OZ. Everytime you change a number OZ will allow you to give a reason for making the change. This makes it easy to spot and explain any variance in your company's key financial indicators. You could never do this with spreadsheets. In fact, many of the features in OZ have never before been available on microcomputers.

OZ is written in plain English with an instructive, step-by-step manual and requires no programming or previous computer experience.

Big corporations are seen as a major market for OZ as are current users of popular spreadsheet like Lotus 1-2-3™ Multiplan™ and VisiCalc!™

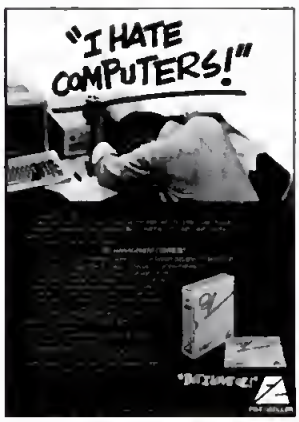
DEALERS EAGER FOR OZ!

Dealers today are spreading the news concerning OZ, the latest introduction from Fox & Geller, the creators of QUICKCODE.

OZ is a stand-alone financial management program specially tailored for managers. OZ enables the user to perform specific managerial tasks using data from OZ files or from existing spreadsheet data files.

Industry analysts predict the Fox & Geller name will guarantee OZ immediate success. "They are well respected", an industry spokesman said recently. "A lot of people are using their dBASE II enhancement packages", he said referring to QUICKCODE and dGRAPH by Fox & Geller.

OZ offers managers the ability to have complete control over their financials. OZ is the first and only software that can actually be used to *(continued on page 44)*



These ads for OZ have appeared in major computer magazines including Infoworld, Byte, PC Magazine, PC Week, Computer Retail News, Computer Merchandising, and Micro Market World.

ASK FOX & GELLER

Q: What is OZ?
A: OZ is a corporate financial management program that you can use by itself or as a companion to your existing spreadsheet. OZ is programed to give you control over budgets, actuals and forecasts with a variety of easy to use functions.

Q: Why do I need OZ?
A: By controlling the financials of an organization you control the organization. OZ gives you this ability. You will know why sales are down, why costs went up, what effect it will have on next year or the rest of this year and what can be done to control it in the future. Imagine, having this much information at your desk.

Q: How is OZ different than a spreadsheet?
A: As good as spreadsheets are, they are very general in their application. OZ was made for managers and is specifically tailored to perform functions managers need on a daily basis.

OZ does what managers have been trying to do with spreadsheets all along. Managerial functions like computer-aided variance analysis, updating and maintaining P&L, organization consolidations, budget forecast and actuals, 3-dimensional financial analysis, built-in reports of key financial indicators and complete color graphic capability to name a few.

Q: Do I have to be a Fortune 500 company to use OZ?
A: No. OZ is as useful for managers in small and medium size businesses as it is for the middle managers in large corporations. OZ is for anyone who wants complete financial information regarding all aspects of their business.

Q: Where do I get OZ?
A: OZ is available at most local computer stores. Or call Fox & Geller directly at

1 800-221-0156

CIRCLE 248 ON READER SERVICE CARD

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*Multiplan is a trademark of Microsoft
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Canadian Headquarters: Tallgrass Technologies (Canada), 1773 Meyerside Drive Mississauga, Ontario, Canada L4V 1H2 / 416/673-3244

European Distributor: CPS Computer Group, LTD Birmingham, England B276BH / (021) 7073866

Australian Headquarters: Tallgrass Technologies (Australia) / Five Dock Plaza, Suite 12/50 Great North Road / Five Dock / Sydney, N.S.W. 2046 / (02) 712-2010

CIRCLE 445 ON READER SERVICE CARD

Tallgrass Technologies Corporation

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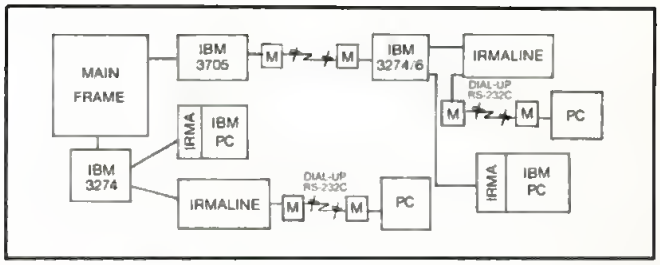

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CIRCLE 117 ON READER SERVICE CARD

IBM Personal Computer Trends and Developments

IH News

FROM THE EDITORS OF PC

JULY 10, 1984

STM PC Screens Full LCD

Toronto company seeks niche between "luggable" and "lap-size" machines

BY KAREN COOK

A little-known Toronto company hopes to take the IBM-compatible market by storm with its STM Portable PC—the first computer to offer a full-sized, 25-line by 80-character liquid crystal display (LCD). The Semi-Tech Microelectronics portable also runs an 80186 microprocessor, faster than an 8088, and it weighs in at a manageable 17 pounds—heavier than a lap-sized machine, but lighter than a "luggable."

The STM Portable PC is positioned in the market against ...well, against virtually every micro already out there. On one hand, STM's compact size gives it an edge against bulkier compatibles from Compaq, Eagle, Corona, and Columbia, according to STM president Lisa Williams. On the other hand, she argues, the STM PC's advanced features will help it against lap-sized computers, which are generally less versatile.

But technical niceties alone don't make a computer—or a company—a success, Williams admits. For young companies with little money and unproven marketing skills, there's often a fine line between finding a niche and getting uncomfortably sandwiched among bigger, richer companies.

Still, the STM PC could be a winner. Among the eye-catching features getting second billing on the $3,449 machine are a built-in

thermal printer, a 300/1200-baud modem with a speaker phone, 256K RAM (expandable to 512K), and two Canon drives with disks formatted for 800K of storage each. A color graphics board displays Lotus' *1-2-3* charts or other graphs at 640-by-200 pixel resolution on the monochrome screen.

Although the full-sized LCD screen is a breakthrough, the characters have none of the clarity that they do on most CRT monitors. At some angles, the screen seems muddy, and it's possible to lose sight of the cursor when looking at a *WordStar* file, for example. However, the display's intensity can be adjusted for viewing comfort, and a unique backlight turns the screen a luminous Caribbean blue that may delight people who work in the dark.

Small Printer

The thermal printer is intended mainly for rough drafts or notes—the paper feeds from a roll attached to the back of the machine. Since the paper is narrow, text files must be printed in a 40-column width. The printer will also rotate type 90 degrees to print a full screen of text or graphics, but 80-column printouts can be done only with the Print Screen command, one screen at a time.

With two RS-232 serial interfaces and a parallel port, the STM PC can be hooked to a color monitor, a letter-quality printer, or other sophisticated peripherals.

The 80186 chip and its 8 MHZ clock offers speed and com-

(continued)

PFS Promoted as IBM's Assistant

Inexpensive family of software gets IBM identity in Assistant Series—all run on PC*jr*

BY JAMES LANGDELL

BOCA RATON—IBM has adopted additional members of a software family to give the PC*jr* and its users more playmates. Nearly all the programs in the new IBM Personal Computer Assistant Series have counterparts in the PFS software family born and raised by Software Publishing Corporation in Mountain View, California. All

(continued)

Over-eager Lawyers Want Clubs to Delete 'IBM'

But Boca gives user groups nod on name

BY MARTIN PORTER

BOCA RATON, Fla.—PC user groups recently got caught in the middle of one IBM department not knowing what the other was doing. Now, PC headquarters in Boca Raton says everyone can relax: It's *not* necessary to delete "IBM" from the name of your user group.

That wasn't the word initially, however, when trademark specialists at IBM corporate headquarters in Armonk, New York, decided they didn't want the magic initials included in user groups' names.

Lawyers in the Office of the Patent and Trademark Counsel fired off letters to "IBM" PC user groups throughout the country, stating:

"The enclosed copy of your advertisement has been noted because of its use of the IBM trademark. No authorization has been granted to your firm to use the IBM trademark in your advertisement."

In the case of one recipient, Dr. Philippe Jeanty of the Yale Medical School "IBM" PC User Group, the letters *I B M* were used only to describe an organization, not a firm, and the ad in question wasn't an ad at all but, rather, the group's free "Club News" listing in *PC Magazine*.

In a return note to IBM's patent office, Jeanty said that the Yale Medical School IBM PC User Group had—with a single keystroke—become the Yale Medical School PC User Group, and he remarked that he would have expected "another kind of treatment from IBM." (Yale Medical School is in the first phase of a 500-PC order.)

"The tone was a bit strong and the word came in a form letter, with a worn ribbon that was barely readable," Jeanty added in a recent interview.

IBM's Response

"We have a program that monitors the use of the IBM trademark; the letters were sent to IBM PC user groups as part of that program," said Jill Liscom at PC headquarters in Boca.

"However, on further consideration we decided we had no objection to user groups continuing with their present names."

After the Armonk letter blitz was discovered and apparently resolved between Armonk and Boca Raton, IBM in Boca said second letters would be sent to user groups to withdraw the proscription. (Ironically, IBM Boca has recently beefed up its user-group liaison program, including sending a newsletter to user groups.)

Jeanty's group wasn't the only one contacted by IBM's patent counsel. The Northeastern New York PC Users Group of Ballston Lake, New York, was also notified that it had broken the rules even though the familiar "IBM" doesn't appear anywhere in its name. It did erroneously appear in a recent issue of *PC Magazine*, however, but this apparently was its only appearance.

Separate Names

PC Magazine learned of about one dozen groups receiving the warnings, which indeed were printed by a dot matrix printer on computer forms, not formal company letterhead.

Technically IBM wants the name of the product separated from the name of the group: Instead of Punxsutawney/IBM PC User Group, the computer maker wants Punxsutawney User Group for the IBM PC.

In light of the exchange of letters, several user groups have gone ahead with the name switch. "After all," says Rich Rhode of the Portland group, "we do have members with other machines than the PC." ■

STM PC *(continued)*

patibility. In its brief appearance at *PC Magazine's* offices, the STM PC passed the industry's quickie test of IBM compatibility with flying colors: It ran Lotus' *1-2-3*, Microsoft's *Flight Simulator*, *XYWrite*, and *WordStar* without immediate difficulty.

STM was founded in 1981 in Toronto, and now has marketing offices in London and Menlo Park, Calif., and a plant in Hong Kong. The company's first product was the Pied Piper, an 8-bit CP/M-based $1,000 machine.

Surprisingly, the Pied Piper's biggest success has been in China. Until recently, STM has had an advantage precisely because it is Canadian, and not American, since Canada traditionally has had better relations with the People's Republic. Now, Williams reports, "IBM is over there in a big way—our people are constantly saying IBM spends so much money, we've got to have more money to take people out to banquets."

In China, working through the bureaucracy is a trial. "It literally takes you 12 months to find out who's a decision maker." Williams learned quickly to ask for business cards before discussing anything. "If they don't have one, I say thank you, but take me to your superior."

Chinese Connection

STM signed contracts to send the Chinese an initial order of 200 Pied Pipers and eventually will help the Chinese reverse-engineer the machine so they can build it themselves.

In the Occident, the Pied Piper's debut struck a less pleasing note. Released as MS-DOS emerged as an industry standard, the CP/M-based Pied Piper's $2 million sales in 1983 were "disappointing," Williams admits, but the setback doesn't diminish her hopes for $10 to $30 million in 1984 sales for the MS-DOS-based STM PC. "We learned a lot of lessons with the Pied Piper—mainly in marketing—and we have a million scars to prove it."

This time around, Williams is paying close attention to computer trends. After studying industry response to the STM PC prototype with a 16-line LCD screen at the COMDEX convention last fall, she decided not to release the machine until STM engineers perfected a full 25-line display. Shipments of the revised PC were scheduled to start this June, after the Atlanta COMDEX.

Williams will avoid using large distributors to get STM products into stores. "We have decided to go as close to the dealer as possible and to cut out the middleman," she says. "Our experience with the Pied Piper was that large distributors started to control our marketing in terms of setting prices," Williams continues. "They were too big for us."

U.S. Push

Williams plans to push the STM PC hardest in the United States, she says, because consumers across the world make purchases based on U.S. sales. "They say, 'wow, if it's selling there, then I want it,'" she remarks.

As a result, though she has companies waiting for the product in places like Britain and Australia, she will wait until next year to sell the computer outside of the United States and Canada.

In Europe, she is working slowly to get set up distribution for the STM. "The European market is treacherous," Williams comments. "Companies like Apple can just go in and set up something like Apple Luxembourg and sell their computers themselves—if you've got money, that's great." However, small manufacturers like STM are completely dependent on powerful nationwide distributors, she says.

In the next year, in addition to crisscrossing the continents to promote the STM PC, Williams will search for venture capital. After all, it may be almost as difficult to sustain a success as to build one: "If this machine takes off, we definitely want to be able to fund it. There's nothing worse than having a cash flow and being thinly capitalized," she says. ■

Lisa Williams: Her Changing Goals

"You can get totally caught up in minute details, and not reflect"

Lisa Williams, president of STM, may finally be in the right place at the right time. In 1981, she and two colleagues sat down to decide what the computer industry needed. The answer, they decided, was an 8-bit CP/M machine, the Pied Piper. By the time that machine emerged in late 1982, the industry rats were starting to dance in droves to the tune of MS-DOS.

Williams, an engineer, took a hard look at the market and went back to the drawing board. Now she has leaped ahead of the game with the STM PC—a lightweight computer, with a state-of-the-art full-sized liquid crystal display, and an Intel 80186, a faster version of the 8088 that drives the IBM PC.

To be sure of getting a supply of 80186 chips, Williams ordered them from Intel 18 months early. "We thought we might be able to sell 20,000 units, so we asked Intel for an order of 100,000—hoping to get an allocation of 20,000—and we did."

That's the kind of foresight and luck her small company will need to survive.

Aussie Engineer

Williams, 31, was born in Australia, the child of two medical doctors.

At 19, she went to Canada to study industrial engineering at the University of Toronto. After graduation, she worked for Toronto Dominion Bank, first as part of a roving consulting group that evaluated bank departments, then as the designer of a micro-to-mainframe database system. After hours, she worked for Andicom Technical Products, a company she formed with Frank Holmes and James Ting, both friends from the University.

"At Andicom [the name is an acronym for Analog Digital Computers] we would be given the specifications to produce a prototype with hardware and software," recounts Williams, who specialized in software development.

When Andicom was bought out by another company, Nahu Manufacturing, Williams quit her bank job to work for a short time in Nahu's preproduction group.

Entrepreneur Bug

But Williams and her old partners had contracted "the entrepreneurial bug." Every Sunday for weeks, they would meet to decide what sort of product they could produce. "If you've got a few hundred thousand dollars in the bank, you constantly ask, 'What can I do with it?'"

To build the 8-bit, CP/M-based Pied Piper, Williams began laying the groundwork for a major company. Thus, the Semi-Tech Microelectronics headquarters in Toronto, the factory in Hong Kong, the office in London, and the U.S. marketing base in Menlo Park, Calif., where Williams now spends much of her time.

Williams keeps close tabs on the gossip in California. "Being there is a real asset, because so much information is passed socially that you otherwise wouldn't have access to. It helps you build a total picture of where your company is going with respect to the industry."

"You can get totally caught up in minute details, and not reflect," Williams muses. "I try to sit back at the end of the day and see if what I've done during the day is moving me closer to the goals, the plans."

As Williams' Pied Piper experience proves, the goals can change daily. "I know," she says. "It's scary."

—Karen Cook

Assistant *(continued)*

the Assistant Series programs can be used on any PC or XT—and even on a PC*jr* with 128K and one double-sided disk drive.

When IBM announced the PC*jr*, it also offered new versions of two PFS packages—*PFS:File* and *PFS:Report*—that could run on the smallest IBM computer.

Now IBM offers enhanced versions of these two programs: *Filing Assistant* ($149), which lets you design and maintain filing systems, and *Reporting Assistant* ($129), which lets you display and print tabular reports created by sorting and organizing records from the *Filing Assistant's* files. This is another move by IBM to make PC*jr* more attractive at a time when dealers have recently been shaving as much as $300 off the price of the machine.

Two additional IBM Assistant Series programs correspond to other existing products in the PFS line. IBM's *Writing Assistant* ($149) and *Graphing Assistant* ($149) have counterparts in *PFS:Write* and *PFS: Graph*. A fifth IBM program, *Planning Assistant* ($149), won't be available until 1985, but Software Publishing says *PFS:Plan* is just around the corner.

IBM claims information can be easily transferred among the Assistant Series programs, a capability that is already a strong trait in the PFS family (see review in "Software Family Dynamics," *PC*, Volume 3 Number 1).

In addition to renaming and repackaging the PFS programs, IBM claims to have enhanced the software itself, making operations, menus, and displays more consistent throughout the Assistant Series programs. On a color display all programs can appear in seven different color combinations and all error messages are in red. Setup and backup procedures and key assignments are standardized; for example, you use the F9 key to exit any Assistant Series program.

IBM enhanced individual programs in particular ways. The *Writing Assistant* package includes *Word Proof*, a spelling checker with a 125,000-word dictionary that IBM introduced last year. The new word processor produces text combining black, blue, red, and green on the IBM Color Printer or a color screen. The *Graphing Assistant* software runs on a monochrome display without special graphics capabilities and can print color graphs and charts on the IBM Color Printer.

Accounting Aids

IBM's Assistant Series will also include three packages of Solutions—forms that adapt the *Filing Assistant* program for particular tasks. The *Home Solutions* ($60) set includes files tailored to keeping records of home finances, addresses, birthdays, and stocks. *Executive Solutions* ($60) maintains a mailing list, checking accounts, stock portfolio, and diskette library. *Accounting Solutions* ($80) handles payroll, inventory, invoice, personnel, and general ledger records. IBM's three Solutions sets are bundles of predefined forms based on those already available in 12 packages of PFS Solutions.

IBM's versions of *PFS:File* and *PFS:Report* were among the most powerful programs in the first wave of software for the PC*jr*. By offering more and better programs at this level, IBM may make the PC*jr* more interesting to serious computer customers. A greater range of PC*jr*-compatible software, along with the heavy discounts on systems that many independent PC*jr* dealers now offer, may attract more users to come play in Junior's yard. ■

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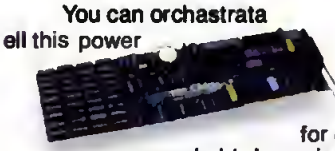

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Gurus Powwow on UNIX, But Few Applications Yet

Bendix's Agee, AT&T executives get attention at Yates-BOSCOM conference on emerging operating system

BY ROBIN WEBSTER

SAN FRANCISCO—The idea that UNIX will be the next Big Event in the software business seems to be maintaining its grip, despite the difficult problems of figuring out exactly what a UNIX operating system is and what it might do.

Since AT&T introduced the UNIX concept over 10 years ago, new and powerful players have joined the game to the point where today there are over 100 UNIX-based products available from independent vendors. Hoping to get a few straight answers and maybe even a few calming words about various UNIX dilemmas, over 200 software and systems developers attended a 13-day UNIX conference here recently, jointly organized by Yates Ventures and the Boston-based BOSCOM Computer center.

The conference was taken quite seriously, attracting speakers such as Thomas Crowley, vice-president of software systems at AT&T; Larry Crume, department head of UNIX system engineering at AT&T/Bell Labs; Bill Gates, chairman of Microsoft; Esther Dyson, president of EDventure; Adam Osborne, CEO of the newly launched Paperback Software International; and Amy Wohl, president of Advanced Office Concepts, to name but a few.

But the big speaker was William Agee, former CEO of Bendix Corporation, and now —as far as the conference was concerned—chairman of the Santa Monica-based Uniform Software Systems. Uniform, which intends to develop and market UNIX applications packages (see related story) was set up by Peter Weiner, formerly of Interactive Systems, which created PC/IX for IBM.

What's a Developer to Do?

One of the problems facing software developers interested in developing UNIX applications, or OEMs looking to bundle UNIX with their hardware, is that they currently have "offers they can't refuse" from the likes of AT&T, IBM, and Microsoft. As spelled out at the conference, this can make the choice about which UNIX version to adopt a nail-biting experience.

On the one hand, AT&T, the home of the UNIX system, has had the de facto UNIX standard for over a decade and continues to release a steady stream of enhancements. Then again, IBM has decided to release the PC/IX single-user, multitasking UNIX system on the PC-XT.

Alternatively there is Microsoft, which has the de facto standard MS-DOS operating system for IBM PCs and compatibles and was one of the earliest independent microcomputer companies to license UNIX source code from AT&T.

Originally, UNIX ran on large minicomputers and was therefore allowed to become rather corpulent. Newer versions have been slimmed to fit onto micro systems, but obstacles still exist. Highlighting this point during his presentation of the PC/IX system, Bob Blake, manager of UNIX development systems at IBM, quipped "We're the people that brought you the 19 diskettes and the 1,800-page manual." Indeed, PC/IX is composed of system modules spread over 19 floppy disks, accompanied by an enormous user manual.

UNIX Mail

Blake added little to what was already known about PC/IX, but he confirmed that IBM intends to release a Fortran 77 compiler, as well as electronic mail software for PC/IX in July. The electronic mail software is based on Interactive Systems' *InMail* and *InNet* packages and will allow PC/IX machines to connect up to "larger UNIX systems."

Even AT&T has recognized the "weight" problem. Rather than shipping the UNIX kernel plus all the programming tools and utilities together, AT&T is trying to split the system into more manageable units. According to Larry Crume, customers will probably soon be able to buy the kernel and a small range of utility programs as a "starter" and then pick and choose from about 50 additional options.

Crume also pointed out that the UNIX system needs a number of enhancements, including the ability to use device drivers that are automatically loaded at boot time (instead of having users follow an arduous specification procedure) and to use bit-mapped displays that could support windowing.

Providing the calming words from AT&T, Thomas Crowley said the giant company would not abandon the latest version of UNIX (System V) for another, more proprietary version. "We'll get hurt if we abandon System V," he said. "If we make a bad move we'll be out there in left field, and that's a hard place to sell systems from. I would only add that there is nothing I've heard today about enhancements to UNIX that isn't on our list." ■

A Bridge from PC/IX to DOS

SAN FRANCISCO—Uniform Software gets a lot of publicity because of its celebrated, controversial backer: William Agee, former head of Bendix Corp. However, the company is eyeing the UNIX marketplace and has a product that Uniform principal Peter Weiner demonstrated during a UNIX forum here.

As standard, the PC/IX system partitions an IBM XT's hard disk so that other IBM-compatible operating systems co-reside with PC/IX. Therefore, the XT runs in a PC-DOS-only mode or a PC/IX-only mode.

Weiner and his Uniform colleagues have created a small program that bridges the two operating environments. At the simple level, users can enter the word "unix" from the PC-DOS A> prompt, and the connector program will go off and load PC/IX. Typing the word "dos" at the PC/IX $ prompt has the opposite effect.

More importantly, though, the bridge runs PC-DOS and PC-DOS applications as background tasks under PC/IX. For example, a user can start a fairly lengthy file sort in *dBASE II* running under PC-DOS and then switch to PC/IX to get on with other work.

Using the LN (link alias to a specified file) command in PC/IX, the user can set up the command chain: $LN DOS TO BASIC. Thereafter, typing "basic" while in the PC/IX environment will load the BASIC interpreter from the PC-DOS disk area. Typing "system" will either return you to PC/IX or PC-DOS, depending upon your preset choice. The linking command is, of course, not restricted to BASIC. It can be used to load any application you wish.

The PC/IX to PC-DOS connector should be available in the third quarter of this year. Versions for MS-DOS and other IBM PC operating systems should follow quickly. —***Robin Webster***

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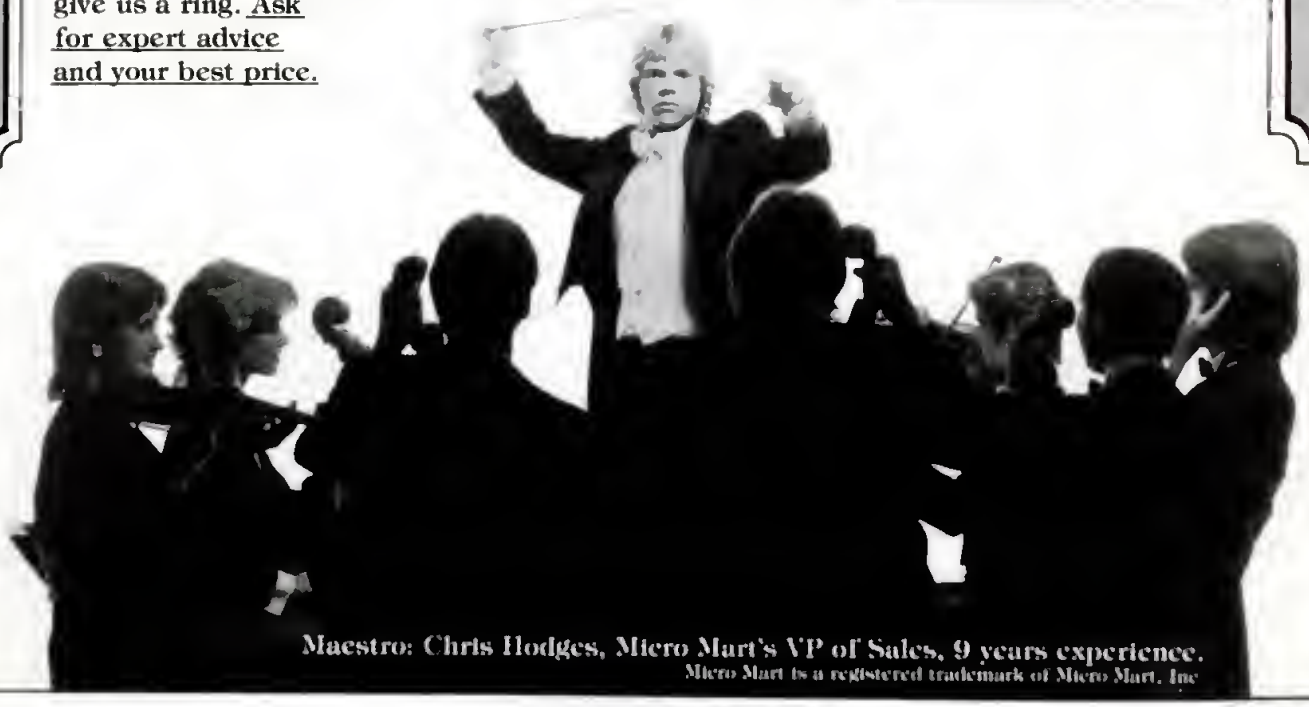

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Otrona and ITT Come Calling with Compatibles

ITT puts marketing muscle behind its XTRA computer, and Otrona's 2001 packs light

NEW YORK—Two more companies are lining up to take shots at the IBM PC with their own PC-compatibles. Both ITT Information Systems and Otrona Advanced Systems Corporation proclaim that their entries are highly compatible and run most of the software developed for the PC.

To improve its machine's chances, giant ITT is plowing $15 million into advertising to bolster the 450 Computerland stores and the members of its direct sales staff that will be pushing the new XTRA. (See *PC*, Volume 3 Number 2, page 41).

Otrona, which until now has developed scientific systems in Boulder, Colorado, is betting on its computer's light, fit-under-an-airplane-seat size and a $2 million ad budget to help its 225 independent dealers. Both companies contend that their machines can operate with any kind of power supply and are designed to meet European ergonomics standards for keyboard tilt and monitor adjustability.

As a perk for novice users, ITT adapted the VisuALL system from Trillian Computer Corporation (for a review of VisuALL see *PC*, Volume 3 Number 9, page 60). VisuALL's series of visual shells simplify the use of programs from ITT's "library" of software packages—*Multiplan*, *WordStar*, and *EasyWriter I*. For $295, the ITT VisuALL package includes a mouse, the driving software, and shells for ITT DOS. Shells for software under the ITT logo are included free.

XTRA comes with its own version of MS-DOS—ITT DOS 2.11—and the ITT ADVANCED BASIC programming language. Based on the Intel 8088, a 16-bit microprocessor, the XTRA has 128K of RAM and is upgradable to 640K. The motherboard contains five expansion slots. The 32K ROM includes self-diagnostics. One parallel port and one serial port allow the user to hook up a printer or add asynchronous communications without using up any of the expansion slots on the motherboard.

XTRA comes with one disk drive; a second drive and a 10 megahyte Winchester hard disk drive are optional. The suggested retail price of XTRA with two floppy disk drives, 128K, monochrome monitor, and a keyboard is $3,500; $6,000 with a hard disk drive. (ITT Information Systems: P.O. Box 52016, Phoenix, AZ 85072, (800) 528-1400.)

At 19 pounds, Otrona's 2001 is lighter and smaller (7 x 15 x 14 inches) than most luggables. Optional 12-inch monochrome or 13-inch color monitors can be placed on top of the machine, permitting a storage compartment for floppy disks to replace the portable 7-inch flat-screen amber CRT.

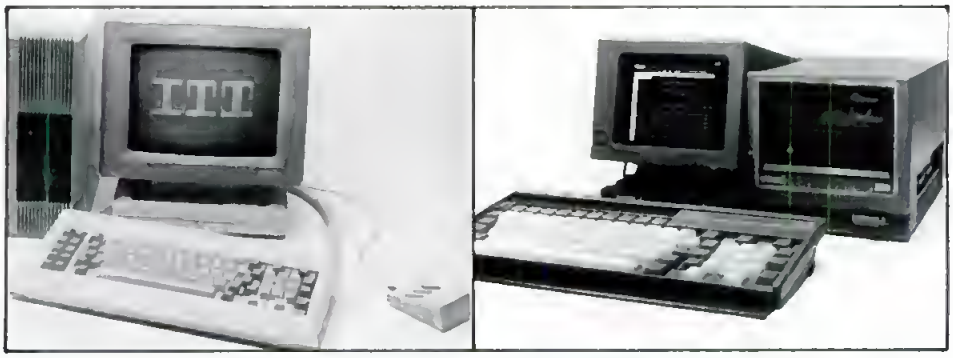
Running the MS-DOS operating system, the 2001 recognizes the standard IBM PC disk format and "quad-density" 96-track-per-inch formats. Its 8088 microprocessor runs at the IBM-standard clock speed, 4.77 MHz.

The motherboard contains three expansion slots. With 128K RAM standard, memory also can be expanded to 640K. The 64K ROM includes diagnostics. A single drive that runs 360K floppy disks is standard, dual floppy or Winchester hard disk drives are optional. A serial port, parallel port, a composite, and RGB connector are also standard.

Options for the 2001 include an RJ-11 connector with the internal modem, a Z-80B processor for 8-bit CP/M programs, a high resolution 640-by-400 pixel graphics board, a synchronous SDLC communications port, an internal 1200/300 baud modem, a PC-compatible expansion chassis, a DC power option with battery pack, and a travel pack.

The 2001 retails for $2,495 and includes one disk drive, 128K RAM, and the portable monochrome monitor; for $2,995, the package will include two drives and 256K.

Otrona, founded in 1977, also manufactures the Attache, an 8-bit, 64K microcomputer, which Otrona president James D. Lindner grandly proclaims is the "second-oldest surviving portable computer." (Otrona Advanced Systems Corp., 4725 Walnut Street, Boulder, CO 80301, (800) 525-7550.) ■



$345 Electric Desk Squeezes onto PCjr

BURLINGTON, Mass.—Alpha Software has squeezed an integrated package onto the 128K PC*jr* for $345 and called it *The Electric Desk*. The four-function—word processing, spreadsheet, database management and communications—package also runs on IBM XTs or PCs with 256K.

By pitching the capabilities and the price slightly under the going rate for integrated packages, Alpha believes it's found its niche. Richard Rabins, Alpha president, hopes *The Electric Desk* is the product that will push PC*jr* sales, much as Lotus' *1-2-3* did for the PC.

The Electric Desk works on up to nine text documents simultaneously, moves text from one document to another, permits sub- and superscripts, and has other standard word processing features. The program also can reformat paragraphs quite rapidly and move data easily from one function to another, judging by a demonstration for the press.

The spreadsheet is 255-by-255 and allows users to protect cells, overlay one spreadsheet on top of another, and display portions of a spreadsheet in windows on a CRT. The communications portion provides for user-delined log-on scripts containing log-on sequences and passwords, automatic dialing of telephone numbers stored in the database, and one-key log-on. The database portion of the program will store a maximum of 65,000 records per database, each with up to 50 characters per field and up to 1,000 fields per record.

The Electric Desk does not overlook the diversity of printers used on the PC: users can choose from a menu of more than 20 popular printers and can also customize *The Electric Desk* for the parameters of their own printers. *The Electric Desk* is available through retailers.

—Howard Karten

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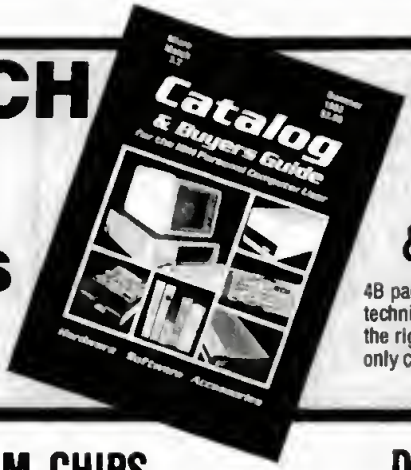

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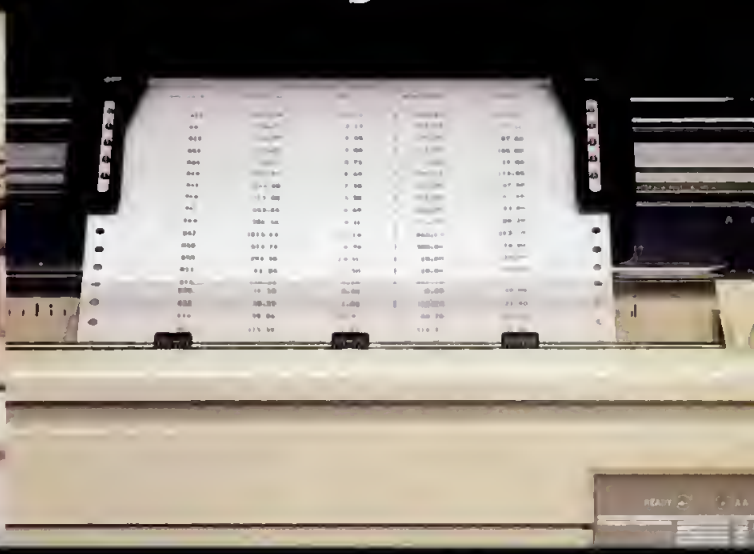

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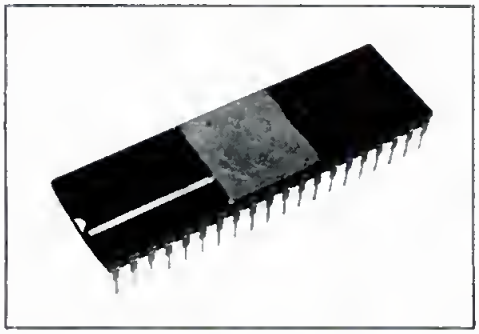

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CIRCLE 457 ON READER SERVICE CARD

IBM Puts Its Network on Hold

New Cabling System links computers with phone-style wires, but LAN is years away

BY KAREN COOK

RYE BROOK, N.Y.—Hold your horses: PC users eager for a local area network (LAN) from IBM will have to wait. In a recent announcement, IBM said it is laying the ground for building-wide networks with the IBM Cabling System—a scheme to wire entire buildings with twisted-pair cables of the sort used in phone lines.

Ultimately, computers will be plugged in anywhere there is an outlet, much as phones are plugged into jacks, and wiring will link them to central wiring boxes or "closets." But none of the computers wired to those "closets" will be talking to each other in networks—at least not for 2 to 3 years, according to IBM's Information Systems Group here.

Other companies have had LANs on the market for several years, so why is IBM waiting so long? "IBM's network will go way beyond PCs. It will link 3270s, 4300s, System 38s—a wide range of machines," explains Ken Sonenclar, program director for the Stamford, Connecticut-based Gartner Group research firm. "Writing software for all those interfaces is a complex job. IBM hasn't completed it yet."

"With good networking, PCs may threaten existing IBM products, and IBM doesn't want to compete against itself," suggests George Alexander, associate editor for Seybold Publications, a microcomputer industry newsletter publisher.

Tasks performed by Series 1, System 38, and "low-end 4300" mainframe applications might be accomplished less expensively by networked PCs with shared peripherals, Alexander says. IBM office machines like Displaywriters and 5520 Administrative Systems "might be eclipsed," he argues.

"With a good networking arrangement, you get a distributed environment—and the most costly parts of it, like printers and disk drives, are shared," says Alexander. "You get all the benefits of a host-based system without all the grave disadvantages, such as single point of failure."

Internal Checks

"IBM knows it has to introduce a network eventually," Alexander says, although any networking scheme will face resistance from IBM's traditional clients, the corporate data processing managers. "The priests of the mainframe don't like to let the users do things without their permission: they really do not want a distributed system with lots of autonomy for every PC," Alexander says.

DP managers are seriously and legitimately concerned that data will not be adequately protected against access by outsiders, Alexander says. "Most networks available now allow everybody access to everything, and that's not acceptable for business applications."

If IBM's announcement is intended to discourage computer users from throwing their support wholeheartedly behind LANs from rival vendors, as other industry watchers speculate, the results undoubtedly will be mixed.

Obviously, some customers will buy from 3Com, Nestar, Corvus or any of the other vendors installing LANs—although they take the risk that IBM's eventual network release will wreak havoc with existing standards, just as IBM PC-DOS toppled CP/M.

Existing Technology

However, IBM's network seems unlikely to contain any dramatic technical innovations, industry watchers say. IBM endorsed a ring configuration for its network, rather than a star-shape—in which terminals run off a central server—or the continuous line or bus configuration used in Ethernet LANs. (In token-ring LANs, data travels from PC to PC along circular path and the token—an electrical signal capable of carrying messages—is passed from one computer to another in an orderly way, much as a baton is passed from one runner to another in a relay race.)

The medium for these LAN data transmissions will be Cabling System's twisted-pair wiring, IBM said. Although twisted-pair cables are common—because they are the same type used for phone systems—they also transmit data at much slower speeds than coaxial or other types of cable used by companies like 3Com or Nestar in their local area networks. In fact, IBM is a chief proponent of coaxial cables to link terminals or even PCs to large computers. ■

Drydock Bank Is a Port for PC Store

MANHATTAN—Last December, the Dollar/Drydock Savings Bank made a unique transaction: it "deposited" computer stores in two of its Manhattan savings bank branches.

But plans for a futuristic merger of computer retailing and financial services may have to be put in drydock, at least for the moment, because of poor customer response in one of the bank-based stores.

"Banks to depositors is always a tough sell," says John McKenna, controller for Dollar/Drydock. "Customers don't appear to be ready for microcomputer services—yet."

Drydock officials first decided to try the computer store experiment last December, after they'd made several satisfying purchases from the Computer Souree, a newly opened store on West 44th Street. Drydock thought that customer response to a computer store might be a barometer of their willingness to try electronic banking—transferring money among accounts or subscribing to financial services from their homes, via their computers. The bankers asked the Computer Souree management to open several outlets in prime Manhattan branch locations.

The Computer Souree jumped at the offer. In a matter of weeks, the company launched stores in two Drydock locations: the lobby of the Drydock branch at the busy corner of Lexington Avenue and 59th (across from Bloomingdale's) and a storefront next to Drydock's 42nd Street bank.

For this newly opened retail operation with expansion on its mind, the opportunity to get prime Manhattan selling space at a lowered rent was too good to miss. The bank's customers would provide a steady flow of passers-by, and the surprising sight of a computer store in a bank seemed likely to attract customers off the street as well.

Unfortunately the idea doesn't seem to have taken off. At the time the store opened, there were lots of holiday-season shoppers in Bloomingdale's, but they didn't cross the avenue to look at computers. Bank customers thought mistakenly that the computers were part of a bank give-away and ignored the display. Some small businesses in the neighborhood stopped in to make inquiries but wound up making their purchases elsewhere. The Computer Souree sold only a few Coleco Adams—a brand its stores no longer carry.

In February, the 59th Street branch's computer section went

(continued)

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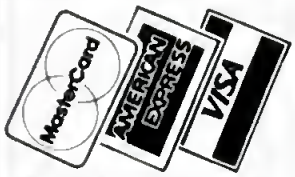

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CIRCLE 810 ON READER SERVICE CARD

Phoenix Says Its BIOS May Foil IBM's Lawsuits

Can Phoenix's work-alike ROM BIOS save some PC-compatible computer makers from going down in flames under fire from IBM's copyright lawyers?

BY JAMES LANGDELL

NORWOOD, Mass.—ROM BIOS software that's just as good as the IBM PC's own is now available to PC-compatible makers, claims Phoenix Software Associates, the company that developed this controversial computer code. The price? $290,000. On first blush, Phoenix Software might seem to deserve a reinventing-the-wheel award for this accomplishment, but its offering may inspire unprecedented interfaces between IBM, its compatible competitors, and the law.

Until now, the degree of PC-compatibility that any IBM competitor could offer has depended on the combined talents of the manufacturer's technical and legal staffs. Even after a computer maker lines up its MS-DOS license from Microsoft, compatibility depends on how close its BIOS (Basic Input Output System) comes to duplicating the results of the BIOS software in the IBM PC's ROM chips.

For maximum compatibility, another company could just copy IBM's software byte for byte—but the ROM BIOS is one part of the PC that's incontestably IBM's own. Already, Big Blue's lawyers have made quick work of suits against Corona, Eagle, and Handwell, which were charged with plagiarizing IBM's copyrighted ROM BIOS (see "PC News" stories in *PC*, Volume 3 Number 6, page 33 and Volume 3 Number 10, page 55.)

In all three settlements with IBM, the smaller company agreed to replace the disputed ROM BIOS in its machines with one that didn't infringe on IBM's copyrights; at least one company, Eagle, had to delay new products for weeks until it could supply a suitable replacement.

While wary micro-makers wait until IBM strikes again, Phoenix offers technical and legal aid in the form of a ROM BIOS that it claims is compatible not only with the PC's software and hardware but with the letter of the law as well.

To develop its ROM BIOS software, Phoenix claims in its press release that it used a process that would assure that none of IBM's original code was wittingly duplicated. One group at Phoenix examined the BIOS software documented in IBM's *Technical Reference* manual, and wrote a set of specifications that described how the program functioned without including any examples of actual code. This description was passed on to a single programmer who tried to write code that fulfilled its specifications. Whenever Phoenix found parts of this new BIOS that didn't work like IBM's, the isolated programmer would be given written descriptions of the problems, but not any coded solutions that might have hinted at IBM's original version of the software.

In the role of the lone programmer, Phoenix cast someone who had never worked with the 8088 or 8086 microprocessors before. "He was a TI-9900 programmer," explains Lance Hansche, vice president of marketing for Phoenix. "The TI-9900 processor is stack oriented—it doesn't have registers like the 8088. There's no way his code could be the same as IBM's—it took us 3 months of memos to convince him to use registers at all!"

Those memos are all part of the "audit trail" that documents the process that created a legal, IBM-compatible BIOS. Phoenix believes that this evidence can establish its innocence beyond any doubt if IBM ever takes legal action against Phoenix or its compatible customers. To reassure these customers, Phoenix has obtained a $2 million policy against copyright infringement suits, issued by an insurance company of the Hartford Group. Providing that coverage is "a risk Hartford would not take lightly," claims Neil J. Colvin, president of Phoenix.

How can cautious compatible computer companies share this protection? Phoenix offers OEMs a software license covering its ROM BIOS and PC-equivalent configurations of MS-DOS 2.11 and GW-BASIC at a one-time price of $290,000. According to Hansche, Phoenix already has some takers, but he can't identify these compatible makers until they announce their own products. (Phoenix Software Associates Ltd., 1420 Providence Hwy. #260, Norwood, MA 02062.) ■

No PCs in the Pool, Please

When a Loveland, Colorado Company brought its own computer to the 1982 World Swimming Championships in Ecuador, it was the first time a computer had been linked to standard timing devices for near-instant analysis of race times.

The IBM PC received its baptismal splash in early 1983 when the same company, Colorado Time Systems, designed a combination of IBM PC hardware and software that tracked times for as many as ten swimmers doing 30 or more laps or "splits" per race—all to thousandth of a second accuracy. The PC stored the data, too, which made quick comparisons of race results throughout the meet possible.

Colorado Time Systems is now selling PCs, special plug-in boards, and software to schools and swimming organizations. Since competition size pools cost at least $1.5 million to build and more to maintain, they are usually in affluent communities—just the market for PCs, according to company president William Beierwaltes.

This unusually athletic PC application by one of its value-added dealers caught IBM's eye: In its 1983 annual report, IBM featured a picture of a Colorado Time Systems PC spotted 5 feet from a swimming pool. "I wouldn't recommend setting it up that way," comments Beierwaltes. "The best place for a PC is in the office, away from the clutter of officials, coaches, and swimmers." —*Karen Cook*

Drydock *(continued)*

under and didn't resurface. "We had trouble maintaining a separate identity there," Madano says. The more independent 42nd Street store is still open, but sales are lower there than at the Computer Souree's flagship store. "The experiment is in limbo at the moment," Drydoek's McKenna says.

The Computer Source still has hopes for eventual success in a bank partnership, but it intends to push on with its own plans. The retailer is building a large service department in a new showroom downtown, and it has hired several people to sell IBM PC and PC-compatible computers directly to corporations. The original 44th Street store, in a desirable position between the Harvard Club and the Yacht Club, continues to do well, Madano says. ■

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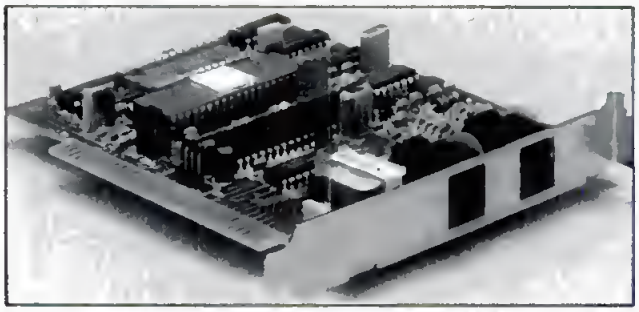
Modem Giant Calls on PCs

Racal-Vadic arrives with smart Maxwell Modems for unattended communication

BY JAMES LANGDELL



The 300PC Maxwell Modem board uses the TI 103—a modem circuit on a single chip.

MILPITAS, California—Racal-Vadic is a dark horse in the PC modem race, which it joined recently by offering a line of internal and stand-alone Maxwell Modems and a communications software package called *George*. Other modems, such as the familiar Hayes' frontrunners, are already well known to micro users, but Racal-Vadic is betting that its track record in telecommunications will help it overcome a late start and make it a winner in a race for the telephone wire.

One of the company's founders, vice-president Kim Maxwell, was coinventor of the first full-duplex, 1200-baud modem. His accomplishment inspired Racal-Vadic to name its new line Maxwell, since it includes modems of that type.

Racal-Vadic has heretofore been an invisible presence in the personal computer market—its modems are built into products from several other micro makers, including Texas Instruments. The Maxwell Modems are the first consumer products to be sold under Racal-Vadic's own name.

Modems Inside and Out

All four models of Maxwell Modems can be used with the IBM and compatible PCs. The 300PC ($325) and 1200PC ($595) are internal modem boards capable of baud rates of 300 and 1200, respectively. These boards have modular phone outlets that face out the back of the computer.

The 300PC board is 5¼ inches long—small enough to fit into the short slots of the IBM Portable PC. Such compactness is made possible by the Texas Instruments 103, a single chip that contains the modem itself. While pointing to the 103 chip, Maxwell said, "It's kind of lost nn the board, surrounded by everything else it needs to work."

The 1200PC has additional circuitry that allows it to handle higher transmission speeds. It uses coherent detection rather than a differential technique to enable the modem to work reliably over a poor telephone line.

The 300V ($325) and 1200V ($595) are external desktop modems that can be used with a wider variety of computers. These modems have no external switches and only one indicator light; all settings can be read and controlled at the terminal.

"Back when memnry was expensive," says Maxwell, "we made units with 40 or 50 switches. And most of our service calls were for switches that were set wrong. Now we'd rather avoid those problems." All the Maxwell Modems automatically detect whether pulse or tone dialing is needed or if Hayes or Vadic protocols are to be used.

These modems also lack speakers; all transmission status information is indicated on the terminal, so you don't have to listen for dial tones. "A modem speaker is a nuisanee in the business environment because of concerns with noise and privacy," says Maxwell. "And it isn't any use in unattended operation."

Speak to George

To get more out of its modems, Racal-Vadic also nffers a cnmmunications software package, named *George*, that wnrks with IBM PCs or compatibles and any switched network modem, such as a Maxwell. *George* is included with the Maxwell internal modem boards; it sells separately for $95.

George offers an autodialing directory where a single keystroke will start dialing the number and execute whatever is needed to log on. The software also lets your system handle unattended file transfer and remote operation.

Error-control can be used in file transfer, following Microcom's XMODEM protocol. This protocol, in Maxwell's opinion, is "not the best, but it's widely used, so it's usually there at the other end of your transmission."

The snftware package includes a text editor that you can use to write and modify messages without leaving the communications program. The software is menu-driven, but as ynu get familiar with the pmgram you can use its single-keystroke commands for greater speed. You also can select items from *George's* directories by typing a "close-enough" name.

Behind the Lines

Racal-Vadic has set up an extensive service and support system for Maxwell Modem users and dealers, including a toll-free number for technical assistance. With this service, a user can connect his or her system for on-line diagnostic tests, which can determine if communications problems are caused by the modem, the software, or the PC itself.

Racal-Vadic has manufactured modems since 1970, and now has revenues of $500 million a year—more than any other modem maker, claims the company. Its first big win, in 1971, was an order from New York's Off-Track Betting Corp. for 1,000 modems. Since then, the company has produced products that scored many communications-industry firsts, including, in 1981, the first "smart" modem with autodialing features. Vadic also established a communications protocol that is widely used in all phases of cnmputing except in purely micro applications, where the Hayes is dominant.

The Maxwell Modems and *George* will be available in August. Despite its late arrival in the consumer market, Maxwell is confident that Racal-Vadic is joining the PC modem business at the right time. "Only about 15 percent of personal computers now have modems," says Maxwell, "and probably only 10 percent get used," because communications services haven't yet lived up to users' expectations.

"On-line networks seem like a good idea to many users until they realize how much it really costs. Even though the number of people signed up for network services grows from month to month, most rarely log on after the novelty wears off—which usually happens when the first bill arrives."

Maxwell believes the computer communications market will take off when an electronic mail system is as effective as hand-carried mail. When that happens, far more modems will be sold than ever before. But if the delivery system isn't running, "for most users, buying a modem," says Maxwell, "would be like installing a mailbox in front of your house when there aren't any letter carriers."

For more information, contact Racal-Vadic, 1525 McCarthy Blvd., Milpitas, CA 95035, (408) 946-2227. ■

ATRON Announces A State of the Art Advance in Software Debugging—PC Probe

PROGRAMMERS AND MANAGERS know that finding bugs during new product development and over the entire product life cycle adds up to a significant portion of total product development cost and support time. Investing in the right debugging tools will greatly improve time to market as well as minimize development cost. Atron Corp. has the right debugging tools for the PC environment. These are:

1) PC PROBE
2) SOFTWARE PROBE
3) PERFORMANCE ANALYZER

PC PROBE plugs into a PC or compatible. It is a total system debugger with features like:

Real Time Trace
Program flow is saved in trace memory while running at full speed. PC PROBE can display trace data as high level language line numbers, procedure names etc. — or as 8088 instructions. In addition, DMA cycles, interrupt lines and external logic probes can be traced. Real time trace answers the question "How did I get here"?

Memory Protection
What good is a debugger that can be wiped out by an undebugged program? PROBE software is write protected and can't be changed.

Hardware Breakpoints
The PC PROBE has 8 breakpoints and can trap conditions such as instruction execution, read, write, IO, DMA, interrupt, or external logic probes. Breakpoints can also be set on ranges of address or data — symbolically too!

Enhanced Human Interface
The PC PROBE designers know the importance of EASE OF USE. The PC PROBE interface has a menu window which displays the syntax of each command — so you never have to remember how a command works. It also recalls the previous invocation of each command to save tedious typing — and tedious thinking!

Symbolic Debugging
Avoid the tedium of sifting through link maps to find out where things are. The PC PROBE uses your C, PASCAL, assembly language program symbols.

Macro Commands
Why be limited by a fixed set of debugging commands? PC PROBE lets you create your own powerful macro commands with parameter passing, nesting, LOOPING and IF/THEN/ELSE control.

ANNOUNCING SOFTWARE PROBE

The same great software used on PC PROBE is now available separately as SOFTWARE PROBE —

ONLY $295

Software probe is the only software debugger available which provides a hardware reset and break box for program crash recovery. What good is a software debugger if you can't get control of run away programs?

PERFORMANCE ANALYZER

How do you find time critical program problems or know where to start performance tuning your software? Get Atron's new Software Performance and Timing Analyzer. Then you can display histograms of how your programs run — by time or by events. You can perform many different timing measurements.

Atron has many happy customers who have made critical product schedules because of PC PROBE. Why waste time on primitive debugging techniques? — Call us today and ask for your 12-page data sheet. Manuals also available for $25.

atron

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CIRCLE 156 ON READER SERVICE CARD

PRODUCT REVIEW

Key Tronic's KB 5151 Selectric Keys in All the Right Places

BY HARRY KRAUSE

KB 5151
Key Tronic Corp.
Department E6
P.O. Box 14687
Spokane, WA 99214
(509) 928-8000
List Price: $255

You're typing along with your favorite word processar and, in the middle of a sentence, you decide to da something really weird, like capitalizing a name. Al Davis, let's say. Pure American. Nothing difficult. Using the faithful pinky on yaur left hand, you stretch and hold down the SHIFT key and type A, as in Al. Then you type D, as in Davis.

Problem is, when you look at yaur screen, what you see is nat what you thought you got. Instead of plain American Al Davis, you've got part of Al's name and a bunch of backslashes.

PC users have complained about the IBM keyboard since the first day the product was introduced. Key Tronic Corporation, of Spokane, Wash., was one of the first companies to join the keyboard battle. Its PC keyboard relocated a couple of keys, had LED indicators to indicate toggle-key status (CapsLock and numeric or cursor keypad), and a different "feel." The keyboard sold like crazy to frustrated PC users and is standard on PC clones from manufacturers such as Columbia and Eagle.

Now Key Tronic has struck again by giving touch typists back the much-loved, standard Selectric typewriter keyboard.

On the Key Tronic KB 5151, all the alphanumeric keys are where a touch typist expects to find them. The keys to the left and the right of the Space Bar have been relocated. You can reach out and touch the Shift, Tab, and Return keys and find them exactly where you expect them to be. Note the LED indicators for CapsLock, and NumLock. Are they toggled on? With this keyboard, you'll know for sure.

That pesky Backslash key touch typists hardly ever use? It's been relocated to the right of the right-hand SHIFT key. And the Backspace key is labeled—can you believe it—Back Space!

Change for the Better

The separate cursor and numeric keypads are, of course, changes of great consequence. Now you can move your cursor where it is needed without seeing 66666666666666666666 on your monitor because you forgot to toggle out of the numeric keypad. This feature alone may make the $255 retail price a bargain to spreadsheet users.

To make room for the separate numeric keypad, the Function keys have been relocated to the top of the keyboard. This is not as strange as it seems; most computer keyboards position the Function keys at the top.

A rundown of additional changes is shown in the table.

The KB 5151 also has an extra pair of Ins-Del keys, located at the top of the cursor control pad, and a mysterious blank key at the top of the keyboard, which does not depress. The blank key may have something to do with a future mouse option, a Key Tronic source said.

There are some other nice features on the KB 5151—they're relatively minor, but aimed at making a typist's job easier. A number of keys—F, J, the 5 in the numeric keypad and the center key in the cursor control keypad—have a slightly raised horizontal bar across the lower portion of their touch surfaces. These bars help a typist find the "home" positions. There's a full-length pencil rack across the top, and Key Tronic packs in a few stiff paper templates that fit in beneath the Function keys so you can make your own labels.

Physically, the keyboard is a tad longer and about an inch deeper than IBM's, and a little heavier. It is enclosed in a metal case and has adjustable legs. The coiled cord easily stretches to 7 feet.

Touch Sensation

What's it like to use? PC users who have become adjusted to the peccadillos of the standard IBM product will need a day or two to internalize the new key positions, but if they were touch typists before they got their PCs, they can go back to their old ways.

The Key Tronic keys have a different touch than the IBM-issue product. They are lighter and require less pressure to strike a letter home.

The KB 5151 is also quieter than the IBM product. It still makes a mechanical-sounding click when you tap on a key, but it is less noticeable.

In its operator's manual, Key Tronic points out a few circumstances in which there might be a conflict when using the cursor control and numeric keypads simultaneously. Basically, Key Tronic points out, some programs might "hang." If these problems occur, the user can immediately disable the separate cursor control keypad. Key Tronic did not state which programs might do this. I tried everything I have—word processors, spreadsheets, databases, and telecommunications—but I wasn't able to make the board fail. ■

Tab	*Now says Tab instead of displaying an arrow*
CapsLock	*Relocated, with an LED indicator.*
Alt	*Relocated*
Shift (left)	*Where it is supposed to be, beneath and to the left of the A key. Labeled Shift.*
Pause	*A new key, duplicating the Ctrl-NumLock operation of the standard PC keyboard.*
Cursor Pad	*A new toggle key, with an LED indicator. It turns on the cursor control keypad.*
Reset	*Another new key. Used in conjunction with the Ctrl key, you can now reset your PC with only two keys. Replaces the Ctrl/Alt/Del combination*
Backspace	*Now labeled Back Space instead of displaying a left-pointing arrow*
~ and '	*The Accent/Tilde key is relocated*
Return	*Relocated and larger than the PC's Enter arrow key. It says Return on it.*
Shift (right)	*Exactly where you'd expect it to be on a Selectric. It says Shift*
\ and |	*Backslash key. Relocated to obscurity, but easy to find when you need to change directories.*
PrtSc	*Relocated out of the typewriter area, but still easily accessible.*

These are some of the nice touches of Key Tronics' Selectric-style keyboard for the PC.

Out with the Old Disks And In with the New

These are trade-in days at your software dealer.

Both Ashton-Tate and Lotus Development, which recently announced flashy new versions of their old best sellers, respectively *dBASE II* and *1-2-3*, are making it easy for old customers to trade up to their new models, *dBASE III* and *Symphony*.

The exchange programs offered by the companies as their products start shipping this summer will be nearly identical. *dBASE III* and *Symphony* will sell for $695 each; *dBASE II* and *1-2-3*, which will remain on the market, will list at $495.

For $200—the difference in cost between the old and the new—current owners can get validated exchange kits from their dealers. The kits contain special mailing boxes for returning the old system, back-up disks, and program documentation to the manufacturer. Customers will receive their new disks within 48 hours after the old products return to their birthplace, say Lotus Development and Ashton-Tate. Lotus' offer is valid through December 31, 1984; Ashton-Tate has not yet set a firm cutoff date.

In an earlier new product announcement, Peachtree Software took a different approach. It said purchasers of its new *Decision Manager* integrated package would receive the first update of the product free.

—Karen Cook

Ampware Scales Our Magazine Mountain

Just by saving each issue of *PC Magazine* on your bookshelf, you soon accumulate a rather daunting reference library. And, if you manage—somehow—to read additional periodicals that focus on the IBM PC, you probably have asked yourself several times a week, "Now when and where was it that I read that article...the one with some facts that will make or break my computing career?" You begin to search—and get buried in paper.

Now there's a way your computer can help deal with all the literature it inspired. Ampware of Cincinnati, Ohio, offers a disk with database files that index over 1,800 articles about the IBM PC that have appeared in *PC Magazine* and six other computer periodicals. The data file is in ASCII format, ready to be searched and sorted with a simple BASIC program supplied by Ampware or with *PC-File*, Jim Button's user-supported database manager (available from Jim Button, Box 5786, Bellevue, WA 98006).

The latest edition of this index needs 240K bytes to list all the articles we—and our colleagues—have published. Ampware claims it will have to resort to a compressed data format in order to fit more articles onto a single disk—and that will only help them keep up with us until the end of the year.

You can obtain a copy of the "PC Magazine Article Index" database disk by sending $9.95 to Ampware, Box 30279, Cincinnati, OH 45230. Updates are available for $5 each, as long as the data can still fit on a disk. What hath *PC* wrought?

—James Langdell

Calendar of Events

DATE	EVENT	COMMENT	LOCATION	CONTACT
June 21-24	Boston Computer Showcase Expo	Hardware and software.	Hynes Auditorium Boston, MA	The Interface Group 300 First Ave. Needham, MA 02194 (800) 325-3300 (617) 449-6000
June 25-27	Personal Computers & Networking	Seminars on using, selecting PCs.	Detroit-Plymouth Hilton Inn Plymouth, MI	Center For Advanced Professional Education 1820 E. Garry St., Suite 110 Santa Ana, CA 92705 (714) 261-0240
June 26-28	PC Expo	IBM PC and compatibles show.	New York Coliseum New York, NY	PC Expo 333 Sylvan Ave. Englewood Cliffs, NJ 07632
June 28-July 1	Milwaukee Computer Showcase Expo	Hardware and software.	MECCA Milwaukee, WI	The Interface Group (See above)
July 9-12	1984 National Computer Conference	Hardware, software, seminars.	Las Vegas Convention Center Las Vegas, NV	AFIPS, Inc. 1899 Preston White Dr. Reston, VA 22091 (703) 620-8940
July 11-12	Personal Computer Local Network Seminar	Seminars on PC local network market.	Hyatt Regency San Francisco, CA	Architecture Technology Corp. P.O. Box 24344 Minneapolis, MN 55424 (612) 935-2035
July 16-17	Computer Security Workshop	Workshop on security needs and concerns of micro users.	Marriott Crystal Gateway Arlington, VA	Computer Security Institute Dept. IP, 43 Boston Post Rd. Northborough, MA 01532 (617) 845-5050

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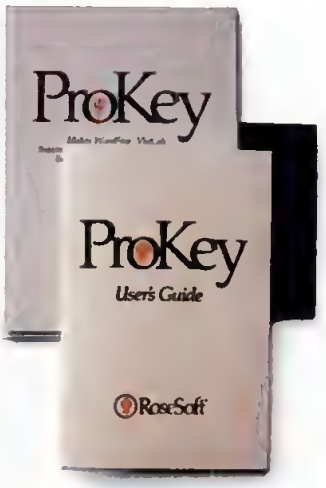

RoseSoft, Inc.
4710 University Way, N.E.,
Suite 601,
Seattle, WA 98105
(206) 524-2350

To run ProKey, you'll need an IBM Personal Computer or workalike, DOS (any version, including 2.0), and 64K of RAM (WordStar requires 96K)

WordStar, VisiCalc, Lotus 1-2-3 and dBase II are trademarks, respectively, of Micro Pro, Visicorp, Lotus and Ashton-Tate

CIRCLE 438 ON READER SERVICE CARD

PRODUCT REVIEW

Latest Samna Word Versions Have Pluses, Minuses; Still Easy to Master

BY JARED TAYLOR

Samna Word II, Version 1.1
List Price: $450
Requirements: 256K, two double-sided disk drives or one floppy and one hard disk. DOS 2.0 or higher.

Samna Word III, Version 1.0
List Price: $650
Requirements: Same as for *Word II*.
SAMNA Corp.
2700 N.E. Expressway
Suite C-700
Atlanta, GA 30345-9990
(800) 241-2065

With a flourish of publicity and a blizzard of press releases, the SAMNA Corp., Atlanta, has brought forth two improved versions of *Samna Word*, a word processing program that took a drubbing in these pages its first time out (see "The Whimsical World of Samna," *PC*, Volume 3 Number 8). Version 1.1 of *Samna Word II* corrects the most serious bugs in Version 1.0 and adds a mailing list feature. It is now a word processor worthy of the name, and has been sent to everyone who got stuck with Version 1.0.

Samna Word III is a souped-up *Word II*; its manual is fatter with another 100 pages worth of features, and its price tag is $200 higher. Unfortunately, both programs still run too slowly. SAMNA Corp. proudly advertises its word processor as "The Pacesetter in Business Software," but it does well just to keep up.

The new *Word II* has, of course, kept all the good features from Version 1.0: slick footnotes, versatile cursor control, simple command structure, numeric tabs, on-screen formatting, and a good disk tutorial.

Even more important, it has corrected the old version's most grievous flaws. For starters, 1.1 will now support the IBM/Epson printer. It will also let you exit directly to DOS, whereas you had to fumble through a warm boot to get out of 1.0. The program still takes 40 seconds to load, but that's down to half the time it took 1.0. Finally, you can now type the tilde (~) character; *Word II* no longer thinks you have issued an illegal command.

Form Letters

The new version's one real advance is Auto Merge, a powerful sequence for writing individualized form letters. To use it, you set up two files: a standard text with blanks held open for name, address, salutation, and whatever else, and a data file to hold that personalized information for as many correspondents as will fit on disk.

The one sub-par feature that could have used a lot of work but didn't get any is Samna's balky text editor. The main trouble with the editor—common to both *Word II* and *Word III*—is that it does so much of its work on-screen. If you want to do something to more than one screenful of text, you have to wait while the program drags the whole thing across the screen as it works every line. The editor refuses to do its job discreetly in the background. Thus, it took nearly a minute to change margins on a 54-line page of text and more than 30 seconds just to delete it.

But the worst annoyance is block moves. Even though it needs 256K of memory, *Word II* has never heard of buffers. It writes every block out to disk and then has to read it back. And text reads in even more slowly than it writes out. It took nearly *2 minutes* to read that sample 54-line page in from the disk. The text creeps slowly up the page like an inbound message communicated at 300 baud.

Another text-editing defect comes disguised as a benefit: *Samna Word* will automatically reformat a paragraph of text after an insertion or deletion. This is more of a bother than a help because, as elsewhere, the program runs so slowly. If you delete a word or two from the beginning of a paragraph, you can't type a correction until the program has reformatted the rest of the paragraph—at about half a second per line.

Latest Word

Word III, SAMNA Corp's new pride and joy, makes a stab at speeding things up by moving short blocks in and out of a buffer. This is an improvement, but not a complete cure. It still takes 13 seconds to drag 54 lines back out of memory, and the buffer chokes on any more than 70 or 80 lines. Shorter moves, though, are almost brisk, and the buffer also allows you to "undelete" your most recent deletion, a forgiving feature that is sorely lacking in *Word II*.

Except for the buffer, though, *Word III*'s editor is the same as *Word II*'s; the other improvements are all add-ons.

Several of *Word III's* new features are excellent. It has a macro-creation module that lets you assign frequently-used character or command sequences to the ten number keys. It has ten different internal keyboards that allow you to switch from QWERTY to foreign-language layouts. It lets you move text or numbers by column as well as by row, and if you have a printer that can roll the paper backward, it can print newspaper-style columns side by side. Also, it makes full use of DOS 2.0's paths and subdirectories, so you can store *Word III* files very conveniently on a hard disk. It even has a math mode that adds columns of figures for you.

But some of *Word III*'s new tricks need polishing. One is the separate dictionary disk, which can check either spelling or hyphenation. The spelling checker, like the text editor, is just too slow. You can easily proofread a file yourself as *Samna Word* grinds through it at nearly a second per line.

Fast to Learn

Another useful but quirky *Word III* feature is automatic backup. This is important because *Word II* doesn't allow you to change a file, decide you liked the original better, and throw away the changes. As soon as you change a *Word II* file, that change is written out to what was originally on disk.

With *Word III*, however, if you turn on its auto backup feature, you will get two backup files in addition to the original, whenever you make a save; one backup is a copy of the original, the other is the previous version of the file. It beats me why you would need a backup of the original, especially since *Samna Word* saves files in its own weird format that uses nearly twice as much disk space as pure ASCII. Saving three copies of every file will quickly fill a disk.

Useful but—believe it or not—slow, is the index generator. It's easy to tell *Word III* what you want indexed and how you want it formatted, and speed isn't essential for such a rarely used feature. Still, a minute and a half seemed like a long time to index eight words in a 36-line document that was on a single page.

Word III has plenty of other razzle-dazzle features, like three levels of help, section numbering, and table of contents generation. But all this pizzazz doesn't amount to much if it's hung onto a text editor you can't love.

Samna Word's saving grace is ease of use. It's a breeze to learn, and the company provides good support over a toll-free phone line. If that's what's important to you and money is no object, *Samna Word II* or *Word III* might be what you need. ■

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People in the News: Dan Doernberg & Rachel Unkefer

Computer books are gobbling up additional bookstore shelves every week, but now they've taken over an entire shop in California. Read on.

BY SUSAN MEYERS

SUNNYVALE, Calif.—To residents in California's Silicon Valley, computer literacy isn't an idea, it's a place. Located in a shopping center in Sunnyvale (next door to Togo's, a popular lunch spot for the local computer crowd), Computer Literacy is the world's only bookshop devoted exclusively to computer books.

Since its opening just over a year ago, the store's stock has swelled from 1,200 to nearly 5,000 titles ranging from beginning guides to PC*jr.* to esoteric handbooks on circuit design. Computer scientists from nearby high tech companies rub shoulders with computer novices, hobbyists, and hackers, while a steady stream of book orders flows in from places as far away as Israel, France, and Japan.

Computer Literacy is clearly a place whose time has come. But in March 1983 when the store's two young owners, Dan Doernberg, 26, and Rachel Unkefer, 25, opened the doors for business, no one expected them to survive.

"People thought we were out of our minds to stock only computer books," Doernberg recalls. "They said we'd never make it. But these books are the hottest thing going right now. People outside the field just don't realize how important it is to get good computer information."

Doernberg became convinced there was a future in computer books while trying to learn about computers himself. "Rachel and I were both liberal arts majors," he explains. "We met at Duke University. I was in psychology and she was in Latin American studies. We'd each taken one very math-oriented computer course and hated it. But a few years later, while I was working at a halfway house in Santa Barbara, California, I had to type 120 copies of the same letter. That's when I started to think about how computers could make life easier."

Hooked on Books

Doernberg began reading and soon he was hooked. "I read everything about computers that I could lay my hands on," he says, "but it was hard to find information. If I went into a computer store looking for a book, the salespeople wanted to sell me a machine. If I went into a bookstore, the clerks didn't know what I was talking about. I decided what I really wanted to do was open a bookstore for people who wanted to find out about computers."

Quitting his job at the halfway house, Doernberg took a course in programming, worked as a technical support person for a computer store, and clerked in a number of book shops. Unkefer—also bitten by the computer bug—studied programming and got a job designing printed circuit boards. Then, scraping together money from personal savings and family loans—"At that point, no bank would have touched us"—they made the move to Silicon Valley, rented a store, and began ordering books.

"But before we even opened," Unkefer puts in, "there were people banging on the door. Our very first customer was a guy visiting the Silicon

Valley as part of a French Ministry of Education project. We weren't ready for business, but we sold him two titles because he said he absolutely had to have them before he went back to France the next day."

Search and Service

"A large part of our energy is spent tracking down obscure titles," says Unkefer, who manages to keep a nearly complete catalog of the store's current stock in her own mental memory bank. "Someone will come in and say they heard that someone in Texas, or maybe it was Oklahoma, has a book on some arcane subject. If we don't have it, I get on the phone and start trying to find it."

Computer Literacy has become something of a Silicon Valley community center. Shortly after opening, Doernberg and Unkefer initiated a program of free monthly talks. They invited computer experts from local universities and high tech companies to come to the store after closing hours and speak on topics of their choice. The talks have become so popular that on occasion they've had to be moved to an auditorium to accommodate the crowd.

In addition to the lectures, there's a Computer Literacy newsletter and a used book service. "We're the only store, outside of a full-time used book store, that buys and sells used computer books," Doernberg says. "It's certainly not a profit maker, but it's a service. We have books here that are out-of-print and impossible to find anywhere else."

Computer Literacy's reputation has been built largely by word of mouth. "We're constantly surprised at the number of people who've heard of us," Doernberg says.

Added Business

Business may become even brisker for Computer Literacy when Stewart Brand's *Whole Earth Software Catalog* comes out later this year. Doernberg and Unkefer have been asked to handle mail order sales and to act as book consultants for the catalog, as well as for the currently available quarterly *Whole Earth Software Review*. (See *PC*, Volume 3 Number 11, page 68.)

Plans are also in the works for a Computer Literacy catalog to come out this summer. Meanwhile, those who can't make it to Sunnyvale to visit the store (described by Stewart Brand in *The Whole Earth Software Review* as "a civilized haven in a savage landscape") can use the phone or the U.S. mail. Computer Literacy—in the hands of Dan Doernberg and Rachel Unkefer—may be just a 20-cent stamp away.

The address:
Computer Literacy Bookshop,
520 Lawrence Expressway,
Suite 310,
Sunnyvale, CA 94086
(408) 730-9955
CompuServe number 75176, 1732. ■

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The FD-PC8 looks like your other IBM PC components. Same styling. Same color. Same dimensions. It stacks neatly under, on top of, or next to your IBM PC, and better still, is only one-half the height of standard 8" drives. Matches Z100 & others also.

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SPECIFICATIONS

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- Exactly ½ the height of standard 8" drives.
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- Power supply designed for long life, trouble-free operation.
- Requires Maynard controller for use on PC.

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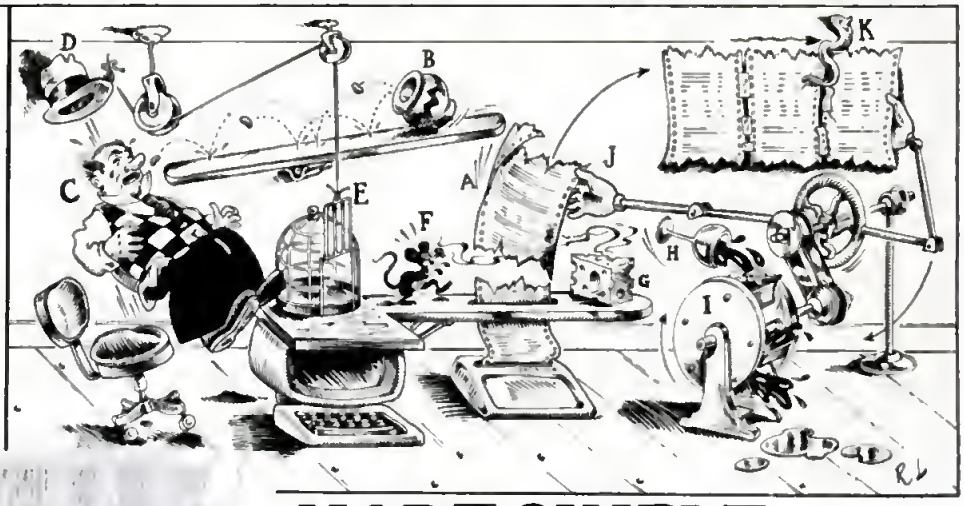
SHEET IS TAPED SECURELY IN PLACE BY TRAINED ADHESIVE TAPE WORM (K).



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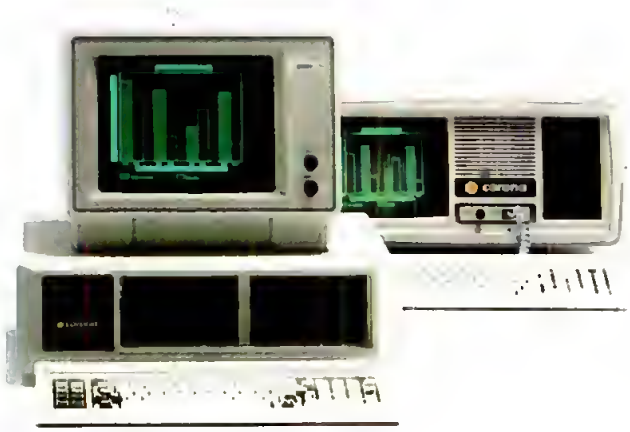

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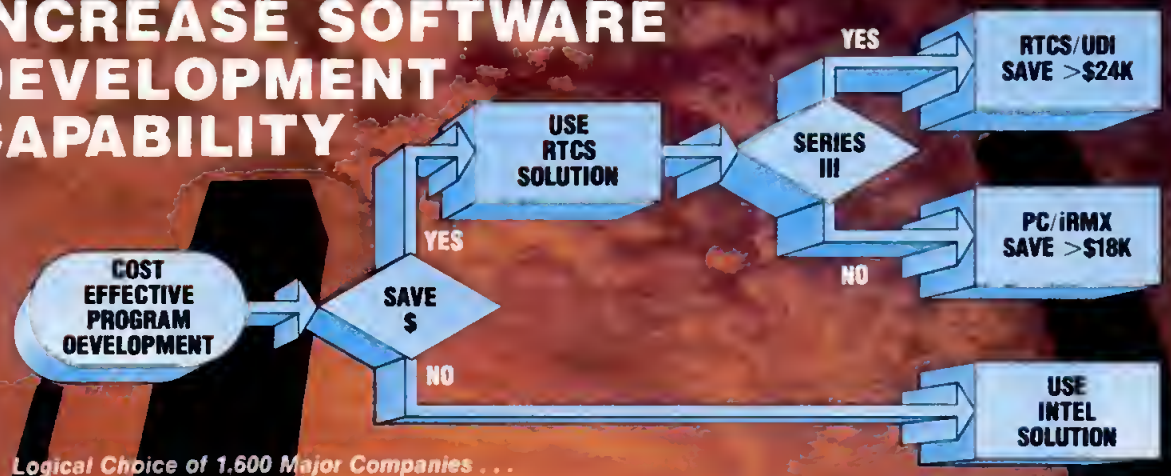

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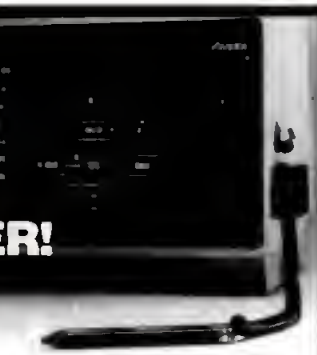

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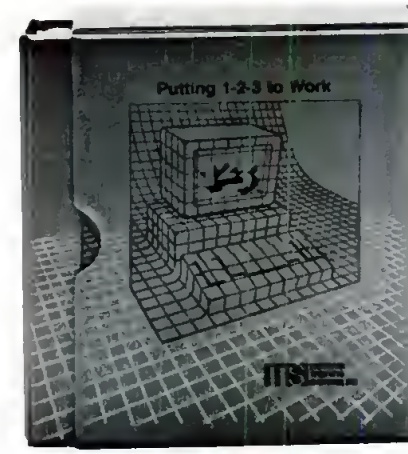

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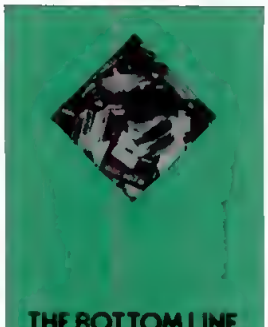

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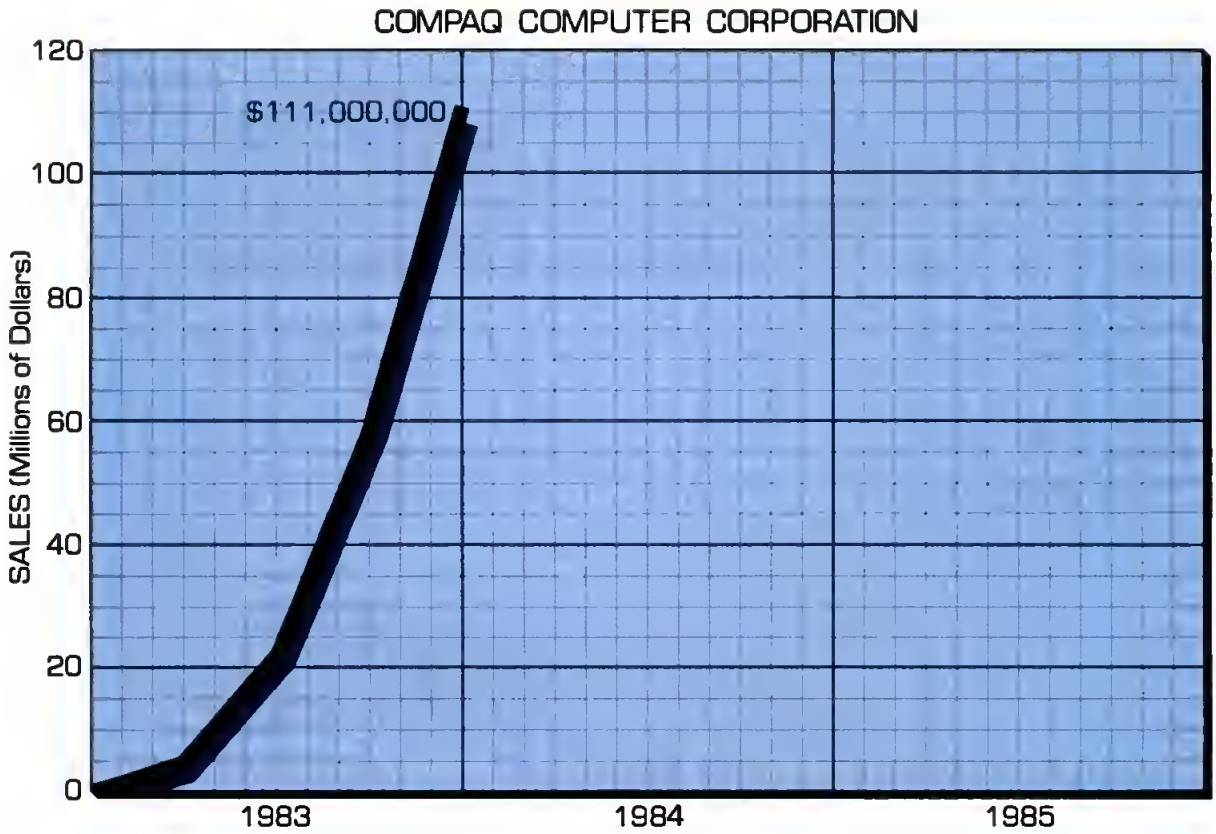

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On the Road Again

When it comes to upgrading software products, integrity is in the eyes of the customer. When it comes to corporate data, it's in the hands of someone called a "data administrator."

There I am, on a plant tour. Or in front of a gaggle of grad students. Or hanging around the Ziff-Davis booth at one of the computer shows.

Everyone asks questions. Lots of questions. What do you see as IBM's next machine in the PC line? What's the significance of UNIX? Will AT&T make it in the computer business? When will the shakeout (pick one) occur? Who will survive? What is the meaning of life?

Usually I'm the one asking the questions. But users and manufacturers alike look to *PC* for our perspective on the industry.

One of the more interesting questions I've been asked lately goes like this: "We've been making changes in our software product. When should we call it a new version, and how should we charge for it?" Another that I've heard often is, "Are we on the verge of an explosion in micro-to-mainframe communications?"

Stan the Man

Of course, there's no absolute answer to the first one, but there is an interesting principle from the field of psychometrics that we can apply. It's called the Just Noticeable Difference, or JND. It says, in essence, that an untrained individual can typically detect a difference between two stimuli (color, weight, and so forth) of about 15 percent. With training, most anyone can halve that threshold. An expert can resolve differences of 5 percent or so. Less than that requires a machine.

Stan Musial was famous for, among other things, being able to select his bat

Bill Machrone

out of the rack by its 2-ounce greater heft, without so much as looking at it. People marveled at his sensitive hands, especially in that they were connected to such powerful arms and shoulders. While his ability was certainly a notch above that of a parlor trick, it was far less spectacular than his timing and strength. Anyone could have done it with a little practice.

And so, with a little practice, a company can divine when it's time for an upgrade. Is there a new feature, one that makes the product more desirable? Or has the company just cleaned up all the bugs from the last version?

In the first case, a company is justified in charging a just-noticeable amount of money for a program's just-noticeable difference in content. The more noticeable the difference, the larger the price can be. The ceiling is some fraction of the original package's price; say, 15 percent.

In the second case, the charge shouldn't be any more than the media and documentation costs—less if the company values the good will of its current customers. The real determinant of whether an upgrade is successful is the customer's perception, not the software publisher's.

The champion upgraders of all time are our friends at MicroPro. I'd been a *WordStar* user since version 0.92, on CP/M. Every time they released a new version, it cost me money. The least I ever spent was $20, and the most was $75. In each case, however, I got something for my money.

New Job Description

What is the future of micro-to-mainframe communications? People want to know if we're on the verge of an explosion in this area. The answer is a qualified "yes."

Most of the technical problems of up- and downloading of data have been solved, and the solutions are moving into

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introducing... SixPakPlus™, the refreshing new 384KB multifunction card! In response to the changing needs of the IBM PC and PC-XT marketplace, AST Research, Inc. is proud to announce the latest addition to our line of multi-function enhancement products, the **SixPakPlus**! This new product is the result of extensive marketing research into the needs of IBM PC users whether they have the original 64K system board, the newer 256K system board, or the PC-XT. The **SixPakPlus** has been engineered to meet these needs at a competitive price while maintaining AST's high standards for quality and reliability.

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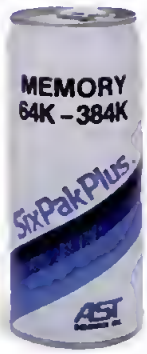

1. RAM memory starting at 64K, user-expandable in 64K increments to 384K. This makes the **SixPak** ideal for the PC or PC-XT with a 256K system board; 384K on a **SixPak** added to 256K on the system board yields 640K, the maximum addressable user memory in these systems.

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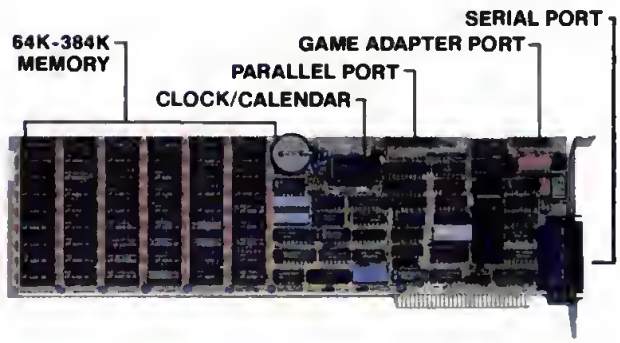

4. A Clock-Calendar with battery backup, featuring an easily replaceable Lithium battery and a quartz-controlled timebase for a high degree of accuracy.

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6. Every **SixPak** comes with an AST SuperPak utility diskette which includes SuperDrive and SuperSpool, the most powerful disk emulator and print spooler software you can get. These programs will greatly enhance the throughput of your PC or PC-XT by emulating disk drive and printer access at RAM speeds rather than the normal slower speed of mechanical devices. SuperPak is the first of such software to be compatible with both DOS 1.1 and DOS 2.0.

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the marketplace. Organization is the real obstacle to growth in this area.

With the advent of the personal computer in the mainframe data manipulation flow, we have seen the emergence of a new function, data administrator. The incumbent (typically an internal consultant in the use of personal computers) is responsible for approving spreadsheet models, file conversions, and the reloading of modified figures into the corporate database.

For example, a large pharmaceutical company establishes model budgets for its division at the corporate level. The figures are downloaded via asynchronous lines to individual plants and distribution facilities. Local operations and finance people create Lotus' *1-2-3* models from a corporate-supplied template, then enter their own detail lines into the budgets. When totaled, their figures modify the estimates sent to them by the corporate budget group. If the resulting figures are significantly different from the corporate numbers, the data model flags them. They then transmit both the numbers and the modified models back to corporate.

The data administrator is the final word on what modifications are allowable to the model used by the plants. She had a hand in creating the prototype spreadsheet model to be used by the divisions. She also consulted with the telecommunications group to recommend use of an error-free protocol for downloading the figures. She schedules the upload transmissions from the various plants, and makes arrangements for disk transfer and local uploading where telecommunications are unfeasible. She informs a systems analyst in the budget group when all the plants and divisions are in, and he runs the extract program that loads the corrected summary figures back into the corporate budget.

If you think that this job sounds like a big pain in the neck, it is. But it is crucial to the integrity of corporate data. It protects users from themselves and one another, lets the DP auditors sleep at night, and reduces the MIS manager's bills from the gastroenterologist.

Will the end user ever be smart enough to chart his own course in data processing? Yes. Will the MIS manager ever accept that fact? No. Hence the data administrator, coming soon to an MIS department near you.

Next question, please ■

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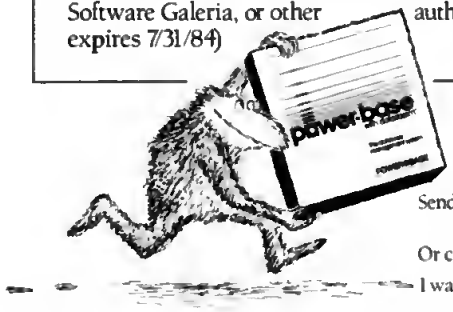

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BULL????

A lot of it is being slung around! Clearly, you need a lot more than just an index finger and an elbow to meaningfully use a computer. Is having a cluttered screen of options and windows easier? After the first blush of novelty and gimmickry and puffery wears off, will it really be easier and better? One thing is for sure — *it is going to take time to shake these new systems out and make them functional in user environments.*

For those who want to have an easy to use, integrated, efficient computer operation now, **SysteMate is the answer!** SysteMate is an user friendly menu driven interface between PC-DOS and applications. When you complete your work with Lotus, Symphony, dBase II, WordStar, or whatever, you exit back to a SysteMate menu instead of DOS. SysteMate is so simple that usage is actually self evident!

If you are up and running, you can use your software with SysteMate to eliminate the redundant "mickey mousing" around with PC-DOS. If you are just getting started, you can use SysteMate and other software to set up a streamlined, functional system. In either case, it is amazingly easy. As needs increase and new software packages come to market, you can integrate them right into your SysteMate!

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- who want to use their computer to increase productivity and profits

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What's in a Name

It's often difficult to tell how good or bad a name for a software product is. What's easy to see are the problems and aggravations involved in finding an acceptable one.

I'm sensitive to names. I agonize with my wife over the naming of our children, and I agonize over the names we at SSI give our computer products. Why are computer names so difficult? Because finding a name is more than just coming up with a nice-sounding word that suggests wonderful advertising campaigns.

When SSI was named, no one checked with an attorney to see if SSI or Satellite Software International was already in use. By the time we named our word processor *WordPerfect*, we were a little smarter and called an attorney.

For a fee, an attorney will search through all registered trademarks, pending trademark applications, and company names filed with state governments for names that might be the same as or similar to the one in question. But even if nothing turns up in the search (and that rarely happens), the attorney makes no guarantee—a company may be using the name without having registered it.

The *WordPerfect* search went well, so we started using the name and filed a trademark application. That was almost 2 years ago; a company in Kansas is still contesting the registration. And though we like the name, it is sometimes confused with *Perfect Writer* and *Letter Perfect*.

The difficulties with *WordPerfect* were slight compared with the naming of our database software. Since *WordPerfect*'s initials were WP, short for word processing, we thought that our database's initials should be DP, short for data processing. After a lengthy deliberation we selected

Pete Peterson

DataPath.

We started using the name, and our lawyer sent off the application. To my surprise, a company called ADP was already using *DataPath*. Their attorney wrote demanding that we stop using their name.

Next we tried *DataProfile*, but there was already a *Profile* and a *DataPro*. We could have argued in court that our mark was not confusing, but we decided to find another name.

After giving up on the initials DP, we tried *DataNow*. Of all the companies and products in the United States, only one had registered the name. It was a small company just 25 miles from our office. By *Now*, I was getting desperate. The product was getting close to release, and I needed a logo, brochures, packaging, and ads immediately.

I gave our lawyer five names at once (I no longer cared about the cost). Unfortunately, *DataFocus* might have been confused with another new database called *PC/Focus; Pathworks* was too close to *PathFinder* and *PathWay* and is used as a company name by a group in California; *DataTrust* was already a company name and a product name; *FirstData* had been used in various similar forms and might be confused with products from First Software; and *DataMagic*, the last choice, had been used 3 or 4 times already.

The working title around the office is now *DataWhatever*. If our two last-ditch choices, *DataPerfect* and *DataPlace*, are not available, then my final hope is the very catchy *SSI Data*. We might also lose SSI someday, but I'm trying not to lose any sleep over that.

There is one consoling thought. We'll never lose the name Satellite Software International. ■

Pete Peterson is executive vice president of SSI and codesigner of the database in question, SSI Data.

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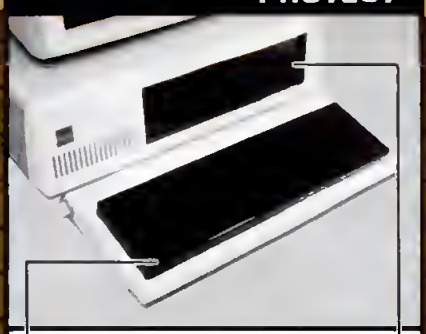

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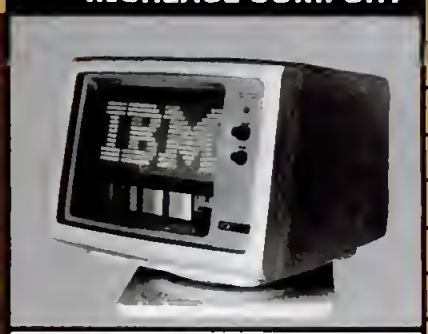

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Letters to PC

The Ghost Writer

Thank you for the mention of our book, *Proportional Spacing on WordStar*, in "New on the Market" (*PC*, Volume 3 Number 7, page 397). The response has been terrific. As the author and publisher writing under our company name, Writing Consultants, I want to point out that the article cited a fellow named Eric Balkan as the author. We've never heard of Balkan but we're sure glad you elected to print the information. He's become a popular fellow around here!

Also, we've just completed a new program, *ProportionalStar*, which automatically makes all the patches described in our book in less than a minute's time. We are in the *WordStar* expansion business, and we're glad you told the readers of PC about us.

Mike Weiner
Fairport, New York

Thanks for letting us know where credit was due. Eric Balkan is the name of the ghost editor at PC who disappears whenever someone turns on the lights.—Ed.

Custom Software

I am writing in response to John Jennings' letter regarding his need for a computer program to handle the records for the municipality of Mill Neck, New York ("Our Town," *PC*, Volume 3 Number 3, page 77). Our company has specialized in writing full-service customized software for the Basic Four, IBM Zilog, and other similar computers. We have recently entered the microcomputer market and can install a system for Jennings operating under a multi-user system that allows the use of inexpensive "dumb" terminals to be linked up with the PC-XT via direct cable connect or modem, which allows the village clerk and Jennings to access the computer programs and files simultaneously.

To maintain flexibility in Jennings' XT, his hard disk can be partitioned to also operate his programs currently running MS-DOS. We will also be offering the capability of transferring between each operating system in the near future. For more information regarding our products and services, Jennings and other readers can contact me or a sales representative at: Software Concepts, Inc., 5530 West Berteau Ave., Chicago, IL 60641, (312) 725-6463.

Eddy J. Secco
Chicago, Illinois

A Pro from the Start

Judith Epstein's article, "MAGNIFI.KEY: Making a Pro Out of *WordStar*," (*PC*, Volume 3 Number 8) is a

good illustration of how a user can design customized *ProKey* macros, but I'd like to clarify one point about using *ProKey* with *WordStar*.

The article didn't mention that the standard *ProKey* package includes a starter set of macros that are ready to use with *WordStar* and several other programs including *1-2-3*, *dBASE II* and *VisiCalc*. The package also includes a file to create a Dvorak keyboard layout.

We wanted your readers to know that they don't have to start from scratch when using *ProKey* with *WordStar*.

Barbara Birdsall
RoseSoft, Inc.
Seattle, Washington

Some Buggy Problems

Microsoft's *Word*, Version 1.0, contains a serious bug that makes the product unsuitable for use with lengthy documents.

The bug is the worst kind a word processor can have. *Word* modifies characters in the text of the document without any warning to the user. Specifically, if you save your documents frequently while using *Word* (a practice recommended by Microsoft), *Word* will occasionally subtract decimal 10 from the ASCII code of one character in the document. For example, it might change the letter *a* into the letter *w*.

This bug is insidious. *Word* gives no warning that it is changing your text. The position of the character in the document is not predictable, and the bug can affect any character.

The easiest way to work around it is to switch from DOS 1.1 to DOS 2.0 or 2.1. I switched to DOS 2.1 a month ago and have not had the problem since. Alternatively, you can purchase version 1.1 of *Word*, which Microsoft claims is free of this bug.

Steve Sall
Beaverton, Oregon

I read with interest the article "Wising Up With KnowledgeMan," about the new database management program from Micro Data Base Systems (MDBS) (*PC*, Volume 3 Number 4). This program offers extreme power and flexibility to first-time mirocomputer users. *KnowledgeMan* also eliminates some of the limitations imposed by *dBASE II*.

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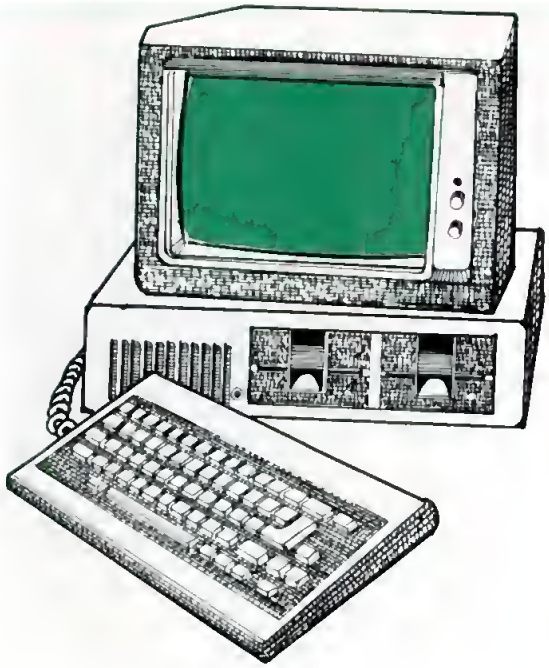

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CIRCLE 183 ON READER SERVICE CARD

While I find *KnowledgeMan* to be a great addition to the DBMS world, I am utterly surprised that a bug mentioned in your review has yet to be removed by MDBS! I'm talking about a simple, basic bug that should have been found and removed in alpha testing by the company. I'm also sure that this bug was detected in beta testing as well. The bug I'm referring to is the one that adds an extra record onto the database when you Append (or Create) a new record. This is such a basic flaw that I'm amazed it's still there. I have to wonder about the company's intentions on technical support and product improvement.

Ralph E. Freshour
Rolling Hills Estates, Califomia

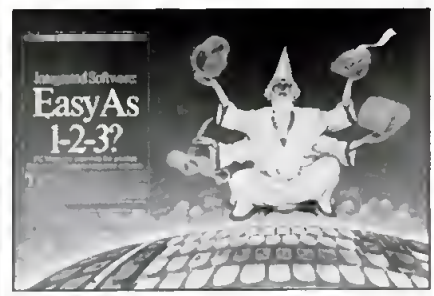
We checked with the technical support people at MDBS, and they say that K-Man *is designed to append a blank record at the beginning of the record: add process, then fill in the blank fields. The only way they could reproduce your problem was by breaking out of the add or create mode with the Esc key. You might want to check with them to see if your procedures match their design intentions.—Ed.*

Integrate or Stand Alone?

I enjoyed the reviews of the various integrated software packages such as Lotus' *1-2-3* in your integrated software issue (*PC*, Volume 3 Number 7). Such packages are obviously a giant leap forward in the drive toward getting maximum productivity from personal computers. It's especially nice not having to constantly swap disks and retype data.

However, I feel that the reviews overlooked one important consideration: How do the individual programs in integrated packages measure up to dedicated standalone programs? The word processing options of most integrated packages look pretty weak next to *WordStar* or *SuperWriter*. And *dBASE II* owners who buy integrated packages may resent paying extra for database capabilities that they already possess or ones that are so rudimentary that they're completely useless.

Increasingly, personal computer users must choose between the convenience and standardization of integrated software and



the individual merits and powerful capabilities of standalone programs. Naturally, many users don't want to choose, especially if they've already made significant investments in software. Many people aren't willing to give up the great features of a spreadsheet program just to get integrated software; they'd rather integrate the programs they already own. Operating environment programs such as VisiOn and Quarterdeck's *Desq* do just that, and are giving users the best of both worlds.

Now that uses have more options available to them, they must ask themselves, "which program is best for my own personal applications?" I'd love to see *PC* compare integrated programs with their standalone equivalents.

Philip Karasick
Vancouver, British Columbia, Canada

The new integrated packages such as Jack2, Framework, *and* Symphony *appear to do what you're asking. We'll be publishing a comprehensive head-to-head comparison in an upcoming issue.—Ed.*

In Support of WordVision

Stephen Manes' interesting review of *WordVision* brought up many useful features of the program, but gave a negative overall interpretation ("Taking a Gamble with *WordVision*," *PC*, Volume 3 Number 6). One person's glitch is another person's useful feature. For example, unlike Manes, I liked the "odious *Vision* keys," and I haven't experienced any confusion using the NumLock and Break keys while programming. There were many other interpretations in the article that I don't agree with.

The subtitle of the review, ". . .—one wrong keystroke and you can lose everything" is seriously in error! I just press the F7 function key ("Files") to get to the file menu while working with text on the screen. Indeed, this is the way it is explained in the manual at the very beginning of the Files chapter of the manual. Thus it takes two keystrokes (Esc and F2 or F4) to discard the working text. The first of these keystrokes causes the screen display to change from the working text screen to a completely different "Final Choices" screen. This screen displays a reminder of the funcion of the F7 key and an extra note if the text has been changed since last filed. I never lost any text, and I am willing to tempt fate by saying that I don't expect I ever will. Also, none of my documents have ever printed with two page 1s, as reported in the review.

I do agree with Manes on one point: I don't care for the keyboad stickers either. The *WordVision* keyboard stickers are not the first set of stickers I won't put on my keyboard. For a while I had the sticker set taped to the front of my system unit, but soon moved it to a bulletin board on the wall. I also agree that the manual deserves high marks, but the Help feature is very good, too. I unintentionally left the manual in a distant office for 4 weeks shortly after getting the package, but I was able to learn most of the system from the Help feature.

Finally, I think Manes misinterpreted the importance of the $79.95 list price. Instead of comparing it the program's earlier $49.95 price, I think it should be compared to the $150 to $400 list prices of other word processing packages. Users who are not full-time or even frequent writers won't get their money's worth out of a $300 word processor. To the many PC users who don't use any word processing package, I say, "go spend the $60 or $70

for a copy of *WordVision* and look forward to havinga lot of fun while writing reports, program documentation, and correspondence."

Murray Spencer
Gaithersburg, Maryland

As a *WordVision* "pioneer" owner (or whatever P.T. Barnum would have called me) I'd like to offer some comments on Stephen Manes' critique of *WordVision* and perhaps offset a few of his potentially misleading comments.

How many copies of WordStar are out there with 50 percent of their features unused?

I agree that a safety stop at the Final Choices panel is needed. But Manes ignores the normal method for saving text to disk, which is to press the F7 ("Files") key while still viewing the text. Doing so takes you to the Files Options panel (from where you cannot accidentally erase the text). This normal process (as well as other *WordVision* processes) becomes second nature to most users and is anything but cumbersome.

The automatic pagination feature in my *WordVision* program does not print two page 1s. It works just fine under all heading conditions.

Label haters will find that the key decals (or optional shells) are only a temporary inconvenience. The control flow of the program allows you to develop a rhythm along with it. Consequently, once you remove the labels (as I have) you won't miss them.

I run *WordVision* on both color and monochrome displays, but I prefer the monochrome. The IBM color graphics card with the IBM color display seriously degrades the scroll action of the program and detracts significantly from the

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CIRCLE 146 ON READER SERVICE CARD

LETTERS TO PC

smoothness of the process. Other color graphics cards may be an improvement.

While many of Manes' comments have merits, the early part of the article focused on perceived faults of *WordVision* and established a tone that may have caused readers to read no further. For example, his description on the quality of "pioneer" editions, may be interpreted by readers as meaning that *WordVision* is liekly to malfunction. That is unfortunate. I believe that the final edition of *WordVision* is one of the most reliable programs I've used.

WordVision is not, in it's basic form, a "heavy duty" word processor. It also does not carry a "heavy duty" word processor price. How many copies of *WordStar* are out there with 50 percent of their features unused? If you are a professional author, are engaged in research work, are in the academic community, or if you have need of a product to handle the complexities of fottnoting and other formal references, then *WordStar* is for you.

Personally, I look for programs that let me focus my attention on what I'm doing, so I'll stick with *WordVision* (and pocket the change I've saved).

Frank Berry
Burke, Virginia

PC Accessories

I'm so glad you were able to incorporate our products into William Howard's article on unique computer accessories ("Offbeat Solutions to Common Problems," *PC*, Volume 3 Number 10). However, our company has since changed its address and phone number.

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Valerie Meifu
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Compatible Delight

Each day, a new article is published implying that IBM-compatible manufacturers are shivering in their corporate boots in the shadow of IBM's ever increasing

capacity to produce PCs. With more IBM PCs available, the compatible market is expected to dry up. Nothing could be further from the truth.

I operate a Bulletin Board System for the Eagle PC and other IBM compatibles on the East Coast. The callers to my BBS are delighted with their machines. It appears that the compatibles have indeed "gone one up on the IBM," providing more features at a reasonable price.

Perhaps one day, a small boy will walk into a ComputerLand and remark: "The emperor has no clothes." When that happens, we compatible users will just sit back and smile.

Alexander J. Drummond
Wilmington, Delaware

Corrections:

The manufacturer given for *CataList* in "A Trio of Mailing List Managers" (*PC*, Volume 3 Number 9, page 280) was incorrect. The correct manufacturer is Automation Consultants, International, 18070 Lake Encino Dr., Encino, CA 91316, (213) 344-9270.

In "Stylish Graphics Lead PC Parade," *PC* reported that Zenith Data Systems' Z-150 desktop and Z-160 portable computers were manufactured by Alps Electric of Japan ("PC News," *PC*, Volume 3 Number 8, page 49). According to a technical manager at Zenith, the keyboards are manufactured by Alps and the computers are manufactured by Zenith, at their facility in St. Joseph, Michigan.

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The APL★PLUS/PC System runs on the IBM PC with 192 KB of RAM, as well as on a number of compatible machines.

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Lessons From Software Veterans

Prospective kitchen table software entrepreneurs can learn from the mistakes, insights, and triumphs of Ms. Smirk, the Boxer, Mr. Easy, the Generals, and Dutch Treat.

In the last two columns, our discussion of the kitchen table software business concentrated on two key economic aspects of selling: production costs and pricing. Now we'll concentrate on marketing and a miscellany of other things. Who constitutes the market for our programs and where can they be found? Is word of mouth or paid advertising the best way to reach these people? How quickly and in what direction should we grow? To liven up our investigation of these issues, I'll quote from the experiences of friends, and to ensure that they remain friends, I'll refer to them by the following aliases: Ms. Smirk, the Boxer, the Generals, Mr. Easy, and Dutch Treat.

Ms. Smirk's business began as a traditional kitchen table operation; a hobbyist programmer, she created some software for her own use and then decided to test its commercial potential. Ms. Smirk's marketing strategy was classic kitchen table: classified ads, demonstrations at user groups, write-ups in newsletters, and similar tactics to drum up business by word of mouth. Since one of the factors common to kitchen table operations is a shortage of money to invest in paid commercial advertising, it's a sound strategy to seize every opportunity for word-of-mouth advertising. After some initial sales, Ms. Smirk began to buy quarter- to half-page ads in the major PC magazines.

All in all, Ms. Smirk has done well, but she's made what seem to me to be some clear mistakes. At one point she passed up the opportunity to create another product, so her business depends on a single piece of software. Because she has three other sources of income, we needn't shed any tears for her, but from the point of view of her software business, we'd have to say she made a mistake. Likewise, after she discovered that the price of her product wasn't ideal, she ignored two opportunities to change it, even though she could have done so with a minimum of difficulty. Our look at the Boxer and the Generals will reveal other things Ms. Smirk might have done wrong.

Peter Norton

The Right Stuff

The Boxer's history is similar to Ms. Smirk's but on a smaller scale. Like Ms. Smirk—and almost everyone else in our case studies—the Boxer's product has very little competition. That's one of the keys to success in all our examples. High-priced and widely used categories of software such as word processors and spreadsheets have plenty of room for competition, but kitchen table programmers selling small, modestly priced software must have niches to themselves. If you're going to be working on a modest scale, it's essential to have a unique product to keep your corner of the market to yourself. Although the Boxer's software is in an area that others could enter easily, he doesn't seem to have any real competition so far. Most of our examples are similarly blessed.

The Boxer's product is priced in the $40 range—considerably lower than Ms. Smirk's. Accordingly, it won't support an expensive advertising campaign. The Boxer publicizes his product as Ms. Smirk does, with quarter- or third-page ads in the major PC magazines. Generally, I think that the Boxer's ad campaign is ideally chosen. He's using the right size ads for his product, neither too big nor too small; the cost of the ads is bearable; and they are big enough to be seen. A typical kitchen table outfit offering a modestly priced soft-

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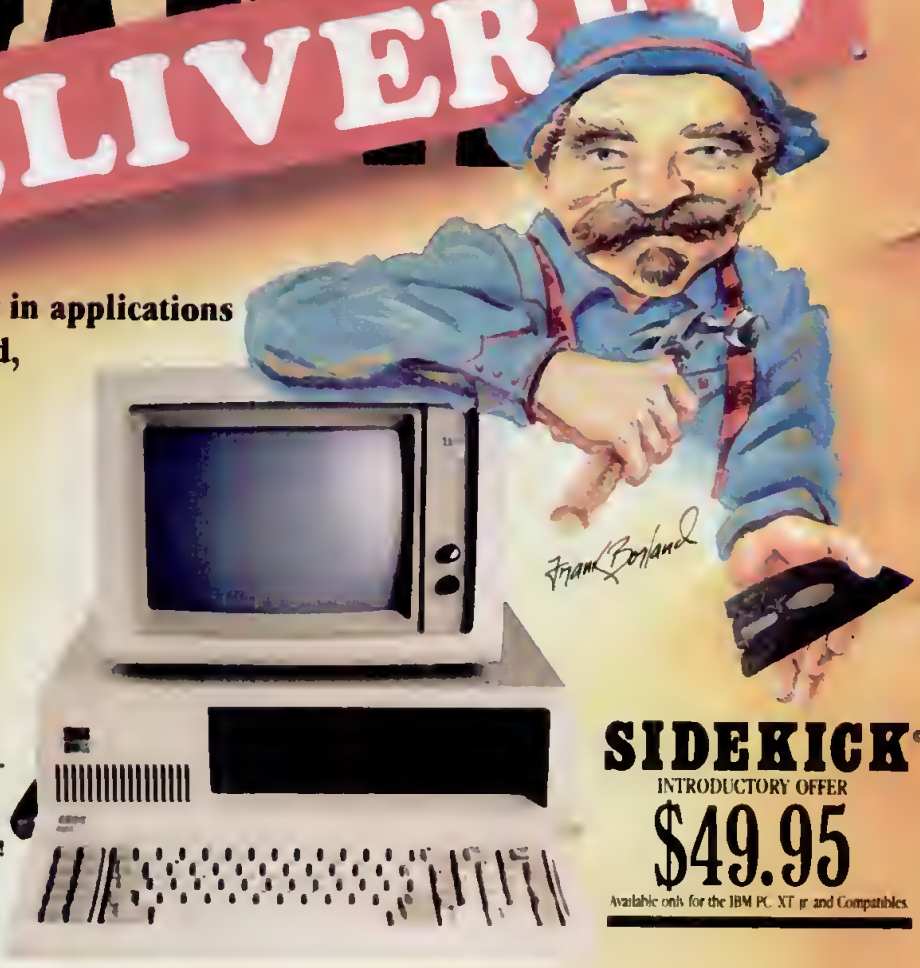

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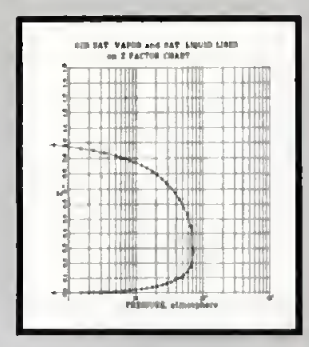

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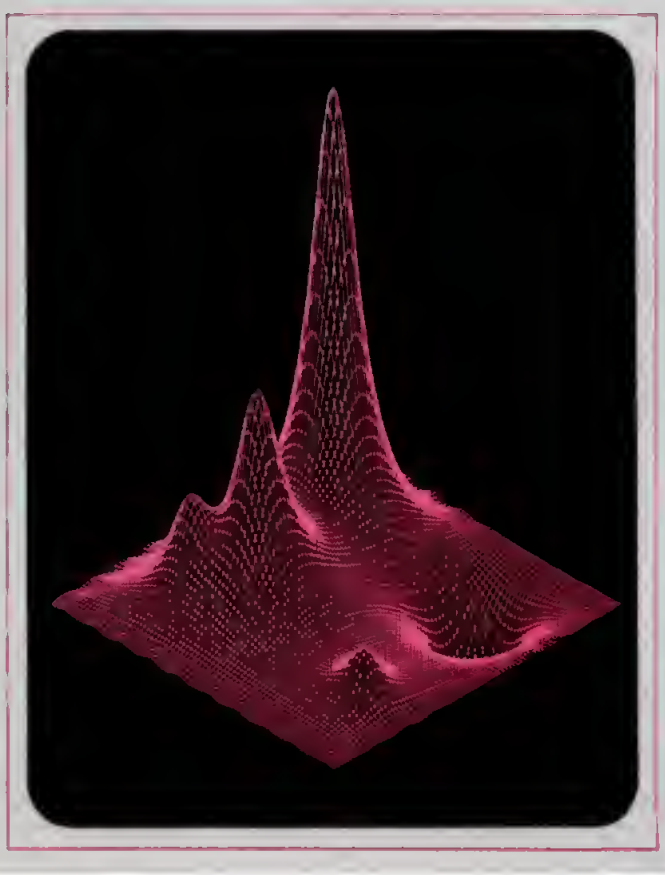

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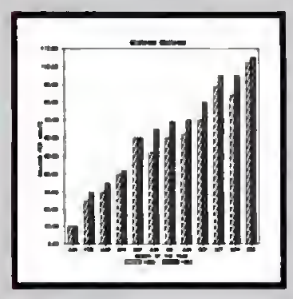

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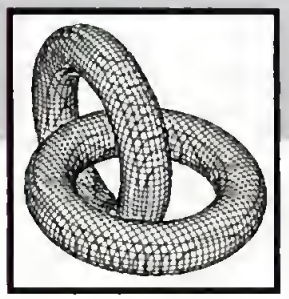

Program Output

Contouring

PLOTCALL is a graphics system that processes standard plotter instructions into a form that can be printed on over 20 dot matrix printers. This is not another print screen program; presentation quality graphics are created directly on the printer to achieve the maximum resolution possible. (120 x 216 dots per inch for Epson printers)

PLOTCALL includes 17 symbol sets for sign making and plot labeling. Symbol sets may be altered, or create your own! Character strings may be created from any symbol set, rotated to any angle, and scaled to any size.

Plots can be created from any language or from digitized data. An interactive plot debugging program allows you to preview a plot on the screen before sending it to the printer.

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ware product would do well to follow the Boxer's model; it has the right price and the right advertising.

The Boxer also did something else right: He followed one successful product with another, very closely related to it. It's a simple principle of success: If you've got a good thing going with one program, capitalize on it with something as closely related as possible; don't write an entirely different kind of program.

From Kitchen to Board Room

While the Boxer represents a step down in scale from Ms. Smirk, the Generals are a step up. The Generals' battle plan calls for an expensive ad campaign with full-page, full-color ads—definitely a high-budget operation. To support it, their one and only program is priced much higher than the Boxer's or Ms. Smirk's. The Generals intend to turn the success of one good program into a real software business, not just a home-grown, kitchen table company. While Ms. Smirk and the Boxer are pocketing their profits, the Generals are investing theirs in expensive ads and a paid programming staff that's developing new programs. If they succeed, they'll create a substantial business and end up at the bank with dump trucks full of money. But if their plan doesn't work out, they'll have squandered the money that their one hit program made for them.

These three entrepreneurs—the Boxer, Ms. Smirk, and the Generals—give us a clear picture of the range that kitchen table software businesses can fit into. They all started out as home operations; each has a single, well-accepted program (though the Boxer now has two), and each has the same kind of production costs (about $5 for a diskette and pamphlet in a vinyl folder). Where they really differ is in the size and ambitiousness of what they are trying to do. Both the Boxer and Ms. Smirk have maintained their amateur standing. The Generals risked their income to create their business and then risked the success of their first program to create more programs. They also undertook all the headaches of owning and running a real business.

I've given these three cases a great deal of thought, and my opinion on who is doing the best keeps changing. The Boxer is following a sensible and profitable route for a part-time programmer. But now that he's had some success, should he be moving up the scale toward Ms. Smirk's type of operation, or would that just be asking for more headaches? Ms. Smirk is doing well—she's probably putting more money in the bank than the other two combined—but isn't she fence-straddling? If the Boxer ought to try to move up to Ms. Smirk's league, perhaps Ms. Smirk is foolish not to invest in the more expensive ads that the Generals use. Look at this issue of *PC:* small black-and-white ads like the Boxer's and Ms. Smirk's can get lost, while full-page, full-color ads get lots of attention. Ms. Smirk thinks the Generals are throwing money away with those expensive ads, but if they are paying off in sales as the Generals say they are, then Ms. Smirk is losing money by not investing in more advertising. These are the sorts of issues that we face when we plan to market our own kitchen table software.

> If you've got a good thing going with one program, capitalize on it by writing something as closely related as possible.

Ms. Smirk, the Boxer, and the Generals are interesting examples to consider, illustrating as they do such a wide range of options open to the software entrepreneur. We can learn some other lessons from two more friends of mine, Mr. Easy and Dutch Treat.

Going for Broke

Mr. Easy started out with an operation much like Ms. Smirk's, but those small black-and-white magazine ads ate up all of his money and didn't sell any programs. Luckily, he found a different avenue for marketing his programs: the numerous software catalogs. As it turned out, the people who needed Mr. Easy's program were hunting for it in those catalogs and not in magazine ads. Now Mr. Easy knows where to sell: He places ads as well as listings in the catalogs. He's doing fine now, I hear, but he agonized for months and wasted a year and his life savings getting where he is now. There's another lesson here: Your customers may not be where you think they are, so look for them everywhere you can.

While Mr. Easy suffered, at least there was a happy ending. Not so for Dutch Treat. Dutch Treat started out, like everyone else, with a really good piece of software that was quickly recognized as a winner. He should have been on the road to success, but he made three serious mistakes. First, he was confused about whether he was in the hardware or software business—and so were his customers. Mistake number two was to treat the IBM PC marketplace like the old days of Z80 computers. His programs were packaged in zip-lock bags—definitely not up to our standards. Third, he did what Ms. Smirk wrongly considered a mistake for the Generals: He spent money on expensive ads and expensive programmers. Ms. Smirk was wrong about the Generals, but she was right that spending that much money was a risky gamble. For Dutch Treat, the gamble didn't pay off, and what could have been a tasty little software business went down the tubes.

These examples will give you plenty of food for thought if you are considering marketing your own software. While that's the end of my tale of my friends Ms. Smirk, the Boxer, the Generals, Mr. Easy, and Dutch Treat, I'll discuss some final thoughts on the kitchen table software business in the next issue. ■

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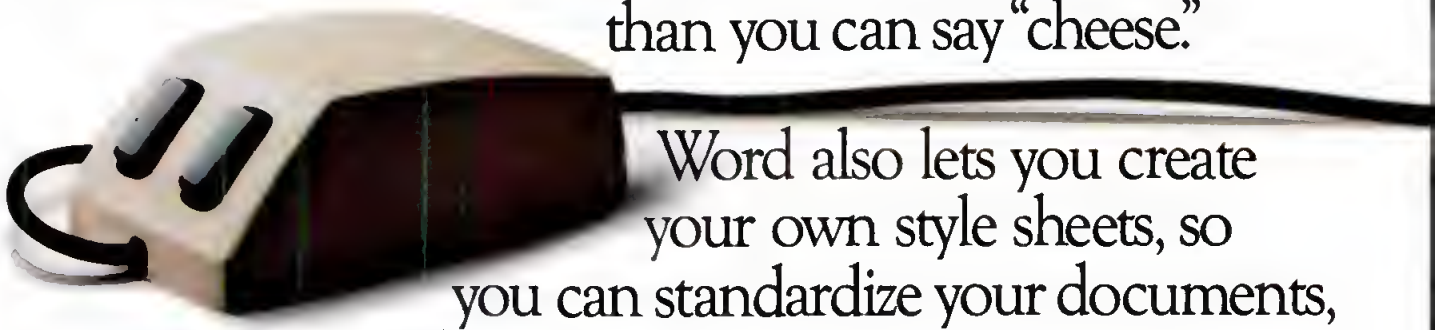

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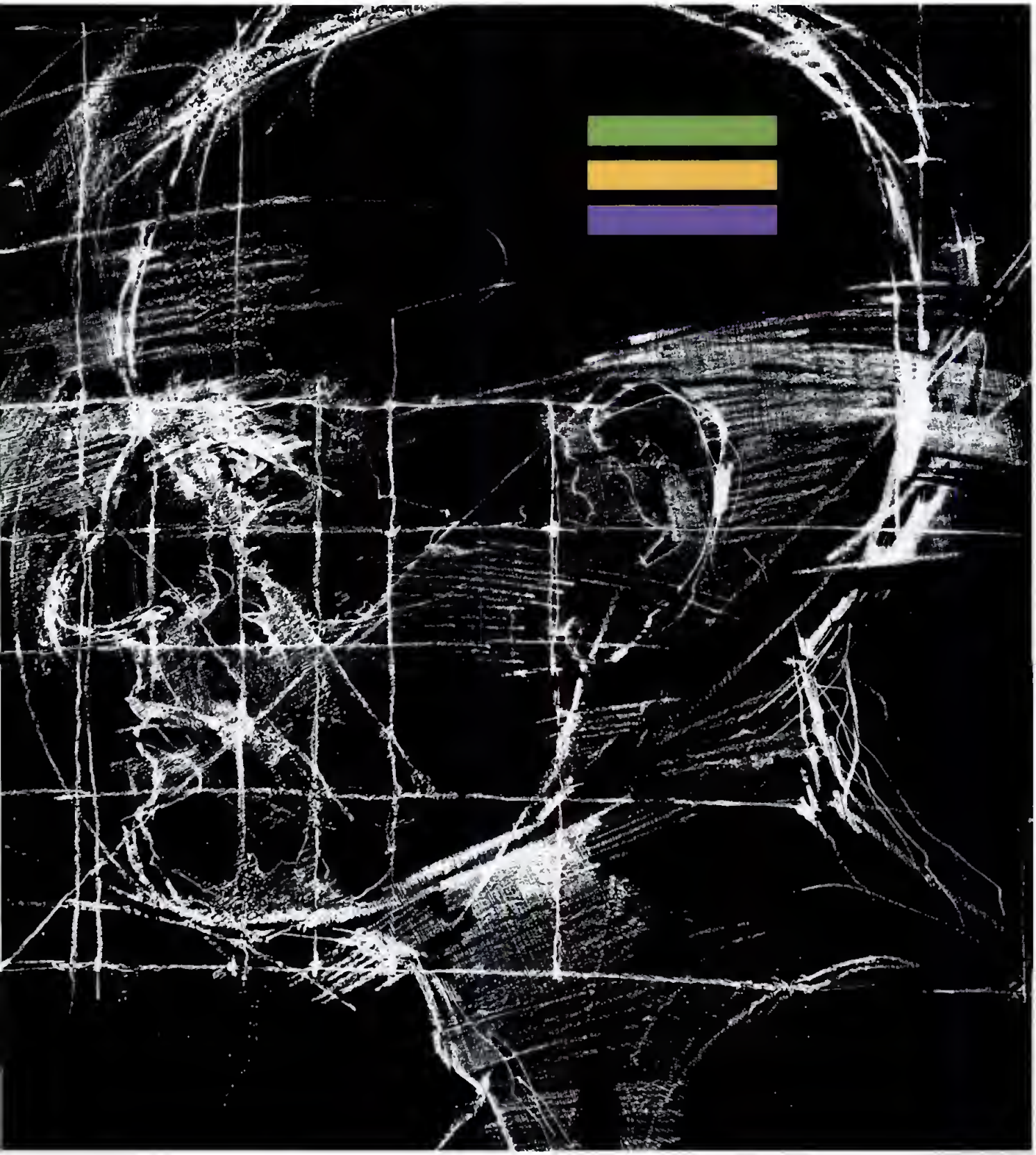
software that links



Taking Stock in MARKET ANALYSIS SOFTWARE

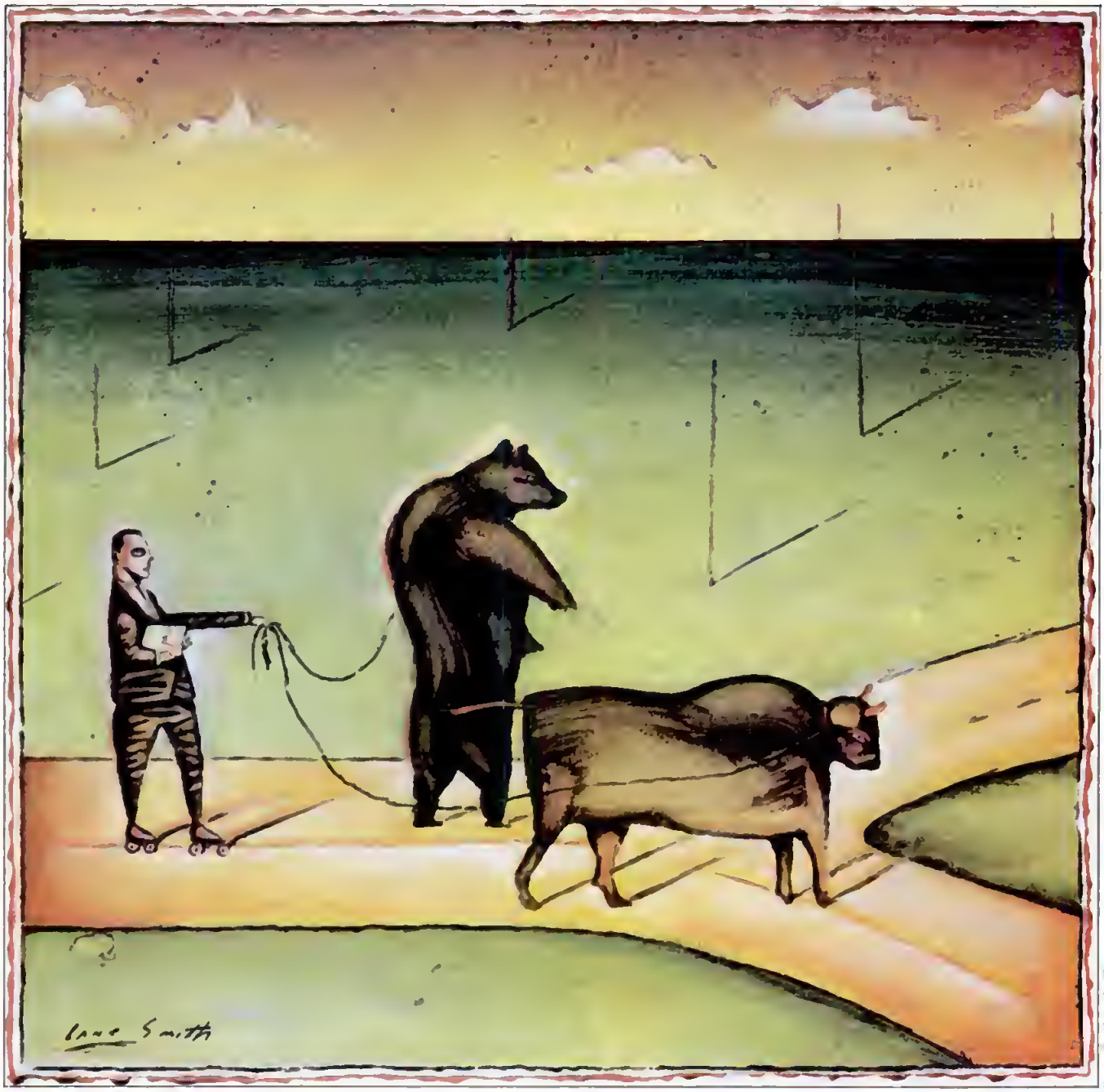


Illustration: Lane Smith

The Brandon Stock System, Market Trend Analysis System, and Buy/Sell Trend Analysis program may help take some of the guesswork out of buying low and selling high.

Stock market investors want to know when to sell and when to buy. Three stock market software packages are now available to help them with their market-timing and stock-selection decisions.

You've heard the comment before: "If they really had a system for making a killing in the stock market, they'd be using it to get rich themselves, rather than telling me about it!" Does this mean the average person—or for that matter the experienced investor—should avoid reading books on stock market investment or buying software that promises insightful information on how to invest in stocks?

To Make a Killing

You don't have to accept as gospel advice given in books or through software packages for making it big in the stock market. You may, however, want to listen to what is said to improve your own stock-trading strategies. If you are in the majority, those people who are interested in the stock market but haven't developed concrete strategies for investment yet, you are lucky. You get to start with a clean slate.

There are almost as many opinions as there are investors concerning where to keep your money and the techniques for finding the best investments. Investment

Brandon Stock System
Brandon Information Management
#99-N
666 West Germantown Pike
Plymouth Meeting, PA 19462
(215) 828-3249
List Price: $325 (plus shipping)
Requires: 128K RAM, two disk drives (one may be hard disk). Optional equipment that is highly recommended includes: Hayes Smartmodem (or fully Hayes compatible), IBM or Epson printer (FX or MX series), Okidata printers with Plug-n-Play option to be supported in future.

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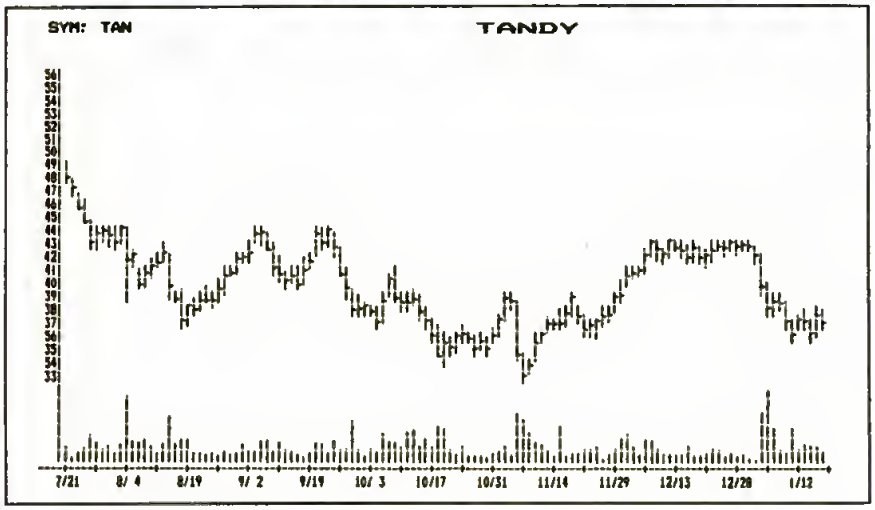


Figure 1: *Graph of daily high/low/close prices and daily volume for Tandy Corporation. Produced by the* Brandon Stock System.

STOCK	DATE	DOWN	UP	ACTION	SIGNS
ASA	1/ 4/84	413	3246	WEAK BUY	EXPIRED
DAL	1/ 4/84	143	315	SELL (SELL STOP)	EXPIRED
DEC	12/12/83	220	3246	WEAK SELL	EXPIRED
DGN	1/11/84	210	3246	SELL (SELL STOP)	UUUDU
DIS	1/18/84	220	3246	WEAK SELL	
FNC	12/20/83	222	226	SELL	EXPIRED
IBM	11/10/83	123	315	SELL	EXPIRED
MCD	10/ 5/83	222	226	SELL	EXPIRED
NWA	11/ 2/83	1111	1316	SELL (SELL STOP)	EXPIRED
PZL	9/26/83	232	237	BUY	EXPIRED
SKB	11/ 8/83	220	219	BUY	EXPIRED
SLB	12/28/83	1311	328	SELL	EXPIRED
TAN	12/ 6/83	311	228	SELL (SELL STOP)	EXPIRED
TDY	1/ 1/ 1	1	1		
UPJ	1/ 9/84	231	318	SELL	DDUNUDD
UTX	1/ 1/ 1	1	1		
WU	12/12/83	232	327	SELL (SELL STOP)	EXPIRED
XRX	1/10/84	2423	1316	BUY (BUY STOP)	NNDUDD

PRESS ANY FUNCTION KEY TO RETURN

Figure 2: *Action Summary report produced by the* Brandon Stock System, *which provides information on when to buy or sell a given stock.*

analysis software provides information to help investors decide what stocks to buy and when to buy them.

The *Brandon Stock System, Market Trend Analysis System,* and *Buy/Sell Trend Analysis System* claim to help users make better stock-trading decisions. The three packages deal more with technical matters than with fundamental analysis. Basically, technical analysis focuses on the analysis of stock market price and volume statistics for a given stock. Fundamental analysis deals with the analysis of historical balance-sheet information, expected earnings, and specific facts surrounding a company's stock, such as the investment community's perception of the company's management strength and product viability.

Although all three are technical-analysis packages, only the *Brandon Stock System* from Brandon Information Management (formerly the Strohl Stock System) focuses on how to pick the right time to buy or sell an individual stock. The other two packages, *Market Trend Analysis System* and *Buy/Sell Trend Analysis System* from Personal Equity Computing, Inc., are designed to help you predict overall market direction rather than whether a given stock's price will go up or down.

If you are a "technician" in the stock market sense, you'll appreciate what these three packages can do for you. If you are a "fundamentalist," you might find capabilities within these packages that will provide supplementary information and thus enhance your decision-making process.

Action-Packed Brandon

The *Brandon Stock System* is a technical-analysis program used to track stocks, bonds, options, and mutual funds. The program incorporates a proprietary buy/sell analysis formula that recommends nine various "actions" you can take on a given stock. The manual advises using the buy/sell analysis formula only with stocks and not with, for instance, bonds, mutual funds, or options.

The package can store and analyze up to 1 year of price and volume trading data. It features automatic updating of up to 45 stocks from the Dow Jones News/Retrieval Service and produces video graphics on either color or monochrome displays and hard-copy graphs on the IBM or Epson FX or MX series printers with *Graftrax*. The *Brandon Stock System* can be configured for a hard disk, but with the current version (1.0), a hard disk can hold only 45 stocks. Version 2.0, scheduled to be released soon, will allow you to configure the hard disk to track up to 500 stocks.

Horror stories about fluctuations in stock prices have kept many people from considering the stock market as a good place to invest. But for others this fluctuation is a key attraction. To those who are willing to take the risk, fluctuations in stock prices present the considerable challenge of deciding when to get into or out of the market.

The idea of buying low and selling high is what technical analysis is all about, and the *Brandon Stock System*'s success is based upon its supposed ability to help the investor do just that. The prices of all

1. The Major Market Indicators including,
   a. Dow Jones Industrial Average
   b. Dow Jones Transportation Ave.
   c. Dow Jones Utilities Average
   d. New York Composite Index
   e. American Market Value Index
   f. NASDAQ OTC Composite
   g. Standard & Poor's 500
   h. Value Line Index
   i. Wilshire 5000 Equity Index
2. The New York Stock Exchange
3. The American Stock Exchange
4. The Over-the-Counter Market
5. Interest Rates
6. International Currency Exchange Rates
7. Market Psychology

Figure 3: *Seven areas that are available for trend analysis by the* Market Trend Analysis System.

```
PEMS (TM)                    Market Trend Analyzer                    04-25-1984
-------------------------------Master Menu-------------------------------

          1  Major Market Indicators - NYSE/AMEX/OTC - daily

          2  Technical Market Indicators - NYSE - daily
          3  Technical Market Indicators - NYSE - weekly
          4  Technical Market Indicators - AMEX - daily
          5  Technical Market Indicators - AMEX - weekly
          6  Technical Market Indicators - OTC - daily

          7  Psychological Market Indicators - daily
          8  Psychological Market Indicators - weekly

          9  Fundamental Market Indicators - daily
         10  Fundamental Market Indicators - weekly

         11  Change Data Diskette
         12  Exit to PEMS Market Data Editor
         13  Exit to Operating System

                                                  Enter Selection __

-----------------------------------------------------------------------
1       2       3       4       5       6<-THIS 7<-LAST 8<-MSTR 9YES    0NO
```

Figure 4: *The* Market Trend Analysis System *master menu.*

stocks fluctuate to some degree over time, and packages like the *Brandon Stock System* work best with the stocks that have the greatest price fluctuation, the so-called "high beta" stocks.

Software packages like the *Brandon Stock System* help you determine whether the current price for a stock is at a good trading point. Technical-analysis software provides a way for investors who do not want to depend solely on the advice of a broker or advisory service to strike out on their own or at least confirm their brokers' advice. Novice and experienced investors alike should find the *Brandon Stock System* a valuable tool for making more informed stock investment decisions.

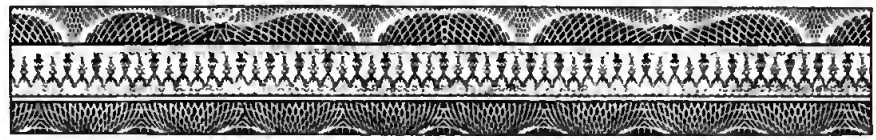
Updating Options

The *Brandon Stock System* bases stock-trading decisions on price and volume movements of stocks you previously identified. The program's maintenance utility allows you to easily add new stocks and list or delete existing stocks.

Once you have entered the names of the initial stocks you want to follow or added a stock to an existing list, the program provides an option to update the recently added stocks through a series of menus, either manually or automatically. The analysis technique requires daily price and volume data for all stocks on your list. If you are following a small number of stocks, say ten or less, consider manual updating. For many stocks, current price and volume data are readily available in your daily newspaper. When more than ten stocks are involved, however, manual updating can be a tedious, time-consuming process.

The automatic price-updating menu has an option for daily updating and historical (several days at a time) updating. If you keep the system current each market day (the vendor-recommended procedure), you will not have to use historical updating except when you first set up the program. If you have to be away for a few days, you can update your stock list using the historical data file on the Dow Jones service.

The *Brandon Stock System* produces



```
PEMS (TM)                    Market Trend Analyzer                    04-25-1984
--------------------Fundamental Market Indicators - Daily---------------------

          Interest Rates                        Exchange Rates

   1  Prime Rate %                        5  British Pound (US$ per Pound)
   2  Federal Funds Closing Bid %         6  Canadian Dollar (US$ per Can. $)
   3  Discount Rate %                     7  French Franc (Francs per US$)
   4  Merrill Lynch Ready Asset %         8  Japanese Yen (Yen per US$)
                                          9  Swiss Franc (Francs per US$)
                                         10  West German Mark (Marks per US$)

                      11  Dow Jones Industrial Average
                      12  New York Composite Index
                      13  Standard & Poor's 500

                      You may select from 1 to 3 items.
                      (Select only 1 for Moving Averages)

                                              Enter 1st Selection __
                                              Enter 2nd Selection __
                                              Enter 3rd Selection __

------------------------------------------------------------------------------
1       2       3       4       5       6<-THIS 7<-LAST 8<-MSTR 9YES     ONO
```

Figure 5: *Possible selection of daily fundamental market indicators available in the* Market Trend Analysis System.

```
PEMS (TM)                    Market Trend Analyzer                    04-25-1984
-----------------Major Market Indicators - Analysis Selection-----------------

                      1  Tabulate Market Indicator(s)
                      2  Plot Market Indicator(s)
                      3  Tabulate Indicator with Moving Average(s)
                      4  Plot Indicator with Moving Average(s)
                      5  Tabulate Percentage Changes
                      6  Plot Percentage Changes
                      7  Tabulate Divergence Analysis
                      8  Plot Divergence Analysis


                                              Start Date __/__/__

                                              End Date   __/__/__

                                                Enter Selection _

------------------------------------------------------------------------------
1       2       3       4       5       6<-THIS 7<-LAST 8<-MSTR 9YES     ONO
```

Figure 6: *Analysis-type selection menu from the* Market Trend Analysis System.

PC RAM FILE

Market Trend Analysis System
Buy/Sell Trend Analysis System
Personal Equity Computing, Inc.
P.O. Box 2105
Ocean, NJ 07712
(800) 431-6082
(201) 922-4726
List Price: Market Trend Analysis $350
Buy/Sell Trend Analysis $295
Requires: 128K RAM, one disk drive (two recommended). Optional equipment that is highly recommended includes: Hayes Smartmodem, Epson MX or FX dot matrix printer capable of high resolution graphics. Color monitor recommended.

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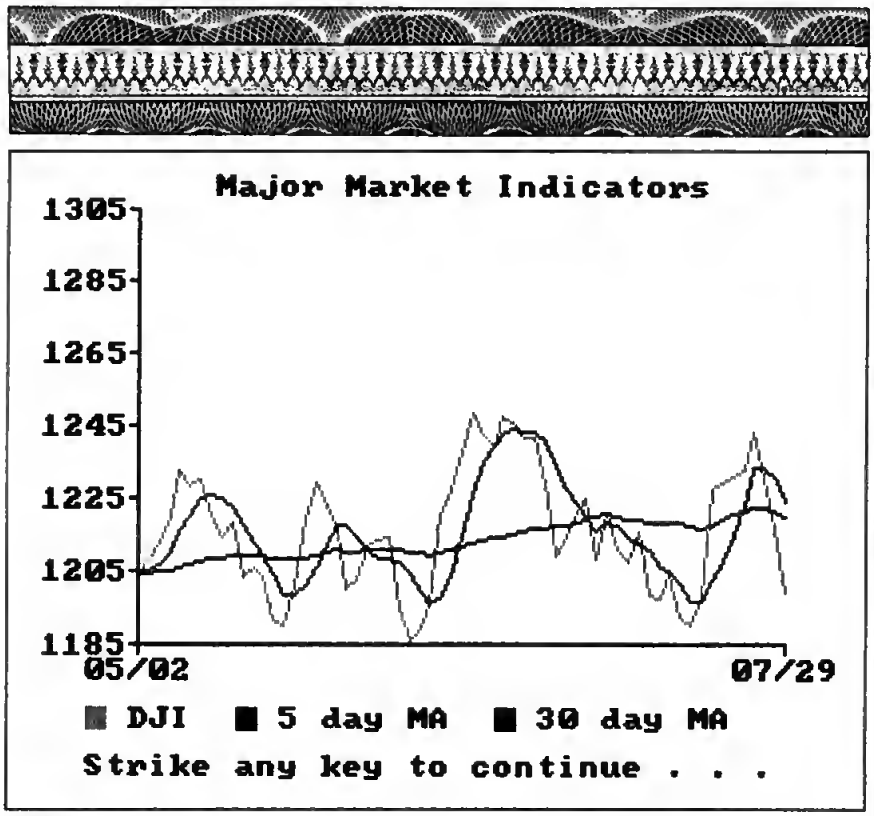


Figure 7: Market Trend Analysis System *comparisan plat shawing how the Daw Janes Industrial average campares to the NASDAQ OTC market average.*

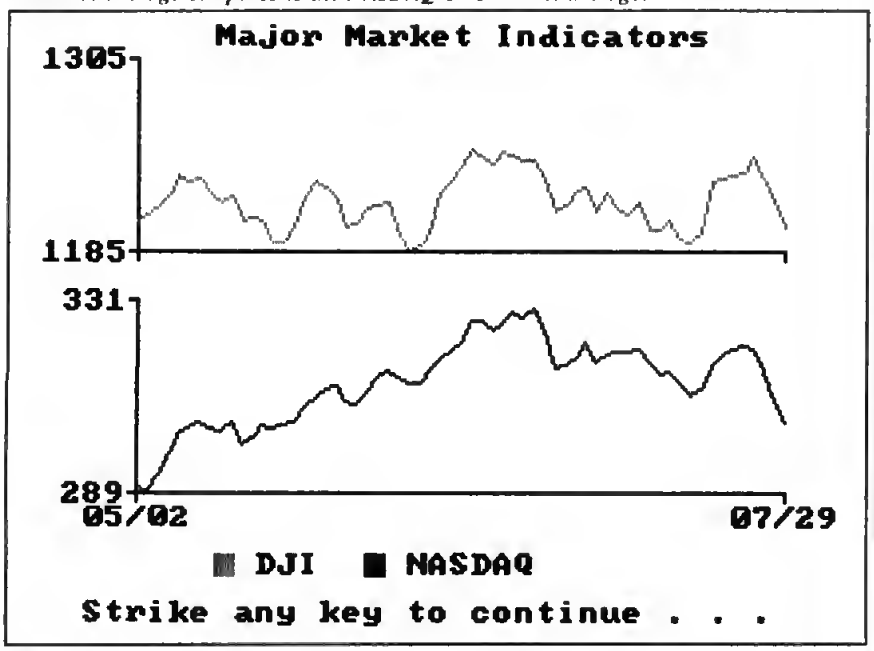


Figure 8: Market Trend Analysis System *output shawing the Dow Jones Industrial average and 5- and 30-day maving averages af the DJI.*

information in the form of graphs and tabular reports as aids to help the investor decide when to buy or sell a given stock. Figure 1 shows a sample graph printed on the Epson MX-80 printer.

Several reports may be produced by selecting various menu options. For a given date you can review a report of the high, low, and close prices, daily volume, and percent change from the previous day for all the stocks you are tracking. Another report with the same format, called the Price History Report, shows one stock's prices and volumes over several days.

The most important report produced by the system is the Action Summary Report. (See Figure 2.) As the daily pricing and volume data are entered into the system and the data are passed through the *Brandon Stock System*'s proprietary buy/sell algorithm, action signals are generated for certain stocks. Only those stocks that are both being tracked and whose price and volume history cause the program to recommend an "action" show up on the Action Summary Report.

The Action Summary Report in Figure 2 shows that a Buy action generated on stock PZL (Pennzoil) on 9/26/83 has expired. If the investor does not act before the "Expired" notice appears in the "Signs" column of the report, it is too late to take the recommended action. You need to update and keep track of what's happening within this system every day.

Notice also in Figure 2 that there is an unexpired recommendation to sell UPJ (Upjohn) on 1/9/84. Since the Action Summary Report shown was produced on 1/19/84, the investor has had approximately 10 days to act on the sell recommendation.

The program can recommend nine actions: Blank (do nothing), Buy, Sell, Weak Buy, Weak Sell, Buy (Protect With Buy Stop Order), Sell (Protect With Sell Stop Order), Fast Buy, and Fast Sell. These actions, what they mean to the investor, and what the investor should do are explained in the user manual, although not in great detail. The next version will

have more information on how to interpret the action codes, a sorely needed addition to the documentation.

New and Improved

Brandon Information Management is working on Version 2.0, a complete rewrite of the *Brandon Stock System*, which was scheduled to be completed last month. According to Alan T. Buck of Brandon Information Systems, author of Versions 1.0 and 2.0, Version 2.0 will be available free to all registered users of Version 1.0 except those purchased from Strohl Stock System. Buck also has an upgrade underway that will take advantage of high-resolution color boards to produce high-quality graphs on the monitor. There will be a nominal charge (around $35) for this upgrade, which will include a new manual and disks.

The enhanced features of Version 2.0 will include single keystroke log-on to the Dow Jones service, optional use of The Source or CompuServe as well as Dow Jones, a full year of volume and price data, automatic dividend adjustment, the ability to track up to 500 stocks if your system has a hard disk, the ability to easily accomplish stock split adjustments, previously defined moving averages for 10, 30, and 200 days, user-defined moving averages, relative performance charts, up/down and on-balance volume, chart scaling options, and compiled code for faster operation.

I tested the "System Setup" portion of Version 2.0 and found that it was a significant improvement over the Version 1.0 setup interface. If the setup is any indication, the Version 2.0 rewrite should be a pleasure to use.

Version 2.0's documentation will also provide extensive discussions of how to interpret the results of the program, particularly the buy and sell actions recommended in the Action Summary Report.

The manual indicates that stocks exhibiting the following qualities are best handled by the *Buy/Sell Analysis System:* minimum price of $20 per share or aver-

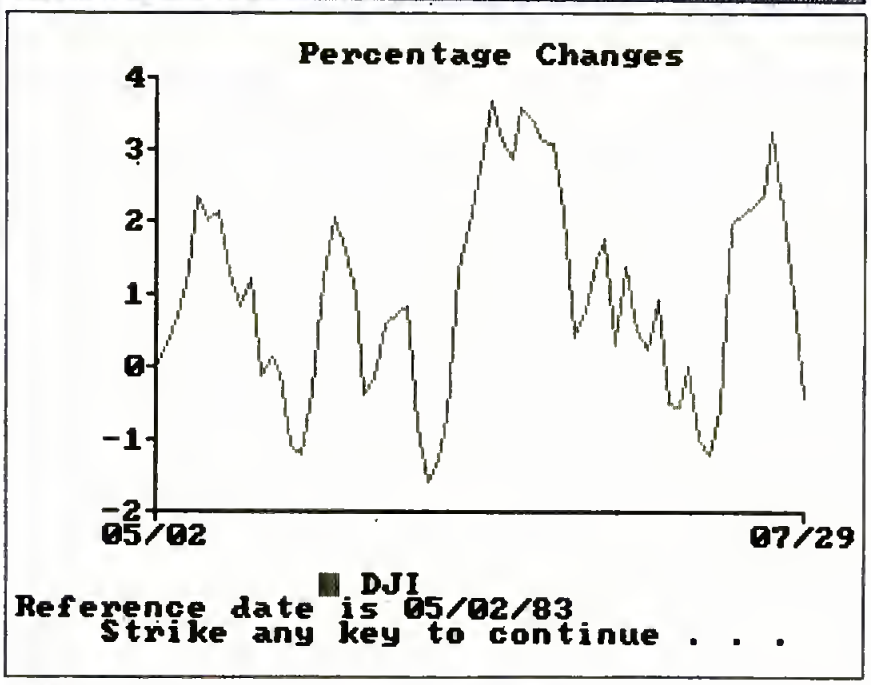


Figure 9: *Percentage change plat from the* Market Trend Analysis System.

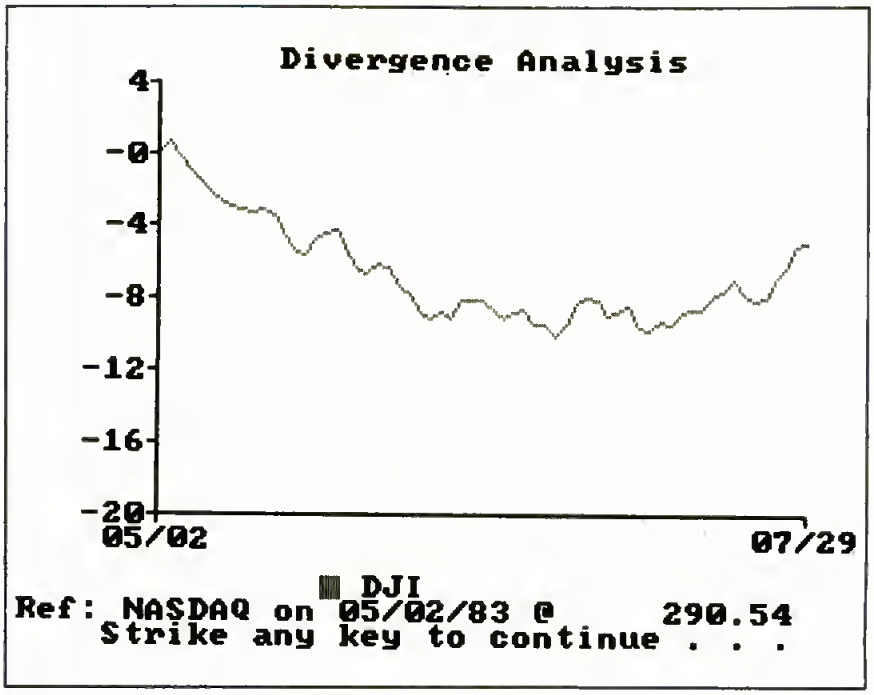


Figure 10: *Divergence analysis plat fram the* Market Trend Analysis System.

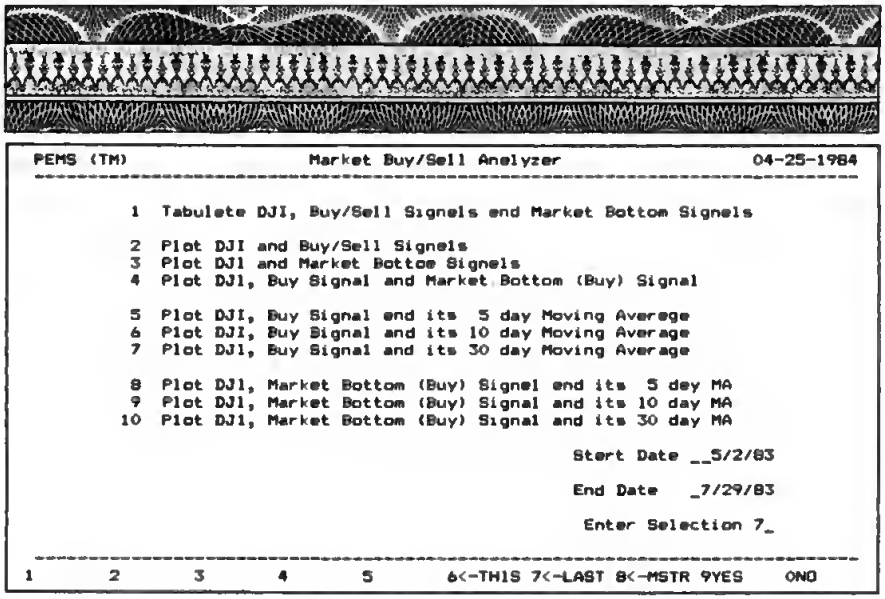


Figure 11: *Menu showing the plotting and report options that are available to users of the* Buy/Sell Trend Analysis System.

age daily volume exceeding 50,000 shares. The manual further notes that the program will not work with low-priced stocks that trade in "sixteenths" and that the system has not been tested extensively with stocks over $200 per share.

The *Brandon Stock System* is heavily supported by the developers. They will answer by telephone any questions you have about software operation and will give advice on how to interpret the action signals.

Total Market Analysis

The *Market Trend Analysis System* is the first of a series of stock market investment-analysis software packages released by Personal Equity Computing, Inc. The developers envision a group of related packages that will provide a consistent, disciplined approach for selectively timing an investor's stocks, options, commodities, and mutual-fund trading. The *Market Trend Analysis System,* part of an overall "decision system" called the Personal Equity Management System (PEMS), was selected as the first package of this series because of the importance of total market direction analysis.

The manual stresses the importance of *total* market analysis as opposed to concentrating on the smaller details and relates this approach to buying stocks. The manual analogizes, "We feel it is of major importance to look at the Markets first and individual stocks second. It is fair to say that many people will look at the trees, but not the forest. If the forest is burning, there is a good chance that the few trees of immediate interest are in jeopardy. On the other hand, if the forest is green and growing nicely, then the trees of immediate interest are likely to grow as well."

The data used by all existing and planned PEMS programs are available to users for a fee of $60 per quarter from Personal Equity Computing's on-line computers. This service has been in beta testing since the fall of 1983 and should be available to PEMS system users by the time you read this.

Trendsetters

The term "trend analysis" is included in the Market Trend Analysis System's name because its purpose is to reveal trends in the overall stock market. The program is designed to reveal these trends in one or more of the seven areas outlined in Figure 3.

Investors can elect to investigate trends in one or all of the seven areas. If you are interested in investing in, say, stocks found primarily in the over-the-counter (OTC) market, you might use the package to help decide what direction this market might take over the next few months. You might also take a look at the trends you could expect in area seven, Market Psychology.

The documentation, which is divided into two main sections, appears to be well organized. The first section tells how to operate the *Market Trend Analysis System* and its associated software. It instructs the user on how to perform various analyses including moving average, percentage change, and divergence analyses.

The first section also explains how to keep the data current, list it, delete it, and rebuild the database if necessary. Since this package contains tremendous amounts of daily data on almost 100 different time series, it is important that it have a good data-management system. Although I could not test all options and indicators because of the size of the database, it appears that the package appears to do a good job of data management. It's menu-style operation makes the task of accessing and using the data in the vast database straightforward.

The second section provides an explanation of all the indicators used in the system. This section and its appendix discuss the interpretation of the results produced by the various analyses in Section I.

Four Analyses

The *Market Trend Analysis System* software allows you to perform four different types of analysis on any of the data maintained in the database: a simple plot of the indicators (up to three indicators can be plotted at a time for comparison), a plot of a single indicator and up to two moving averages of that indicator (users may pick from among 5-, 10-, 30-, and 150-day moving averages), a plot of the percentage

change in an indicator from a given point in time, and a plot of the divergence of one indicator from another computed from a given point in time. The analysis results may be tabulated as well as graphed.

Figure 4 shows the master menu, from which you select one of the first ten items to indicate if you wish the Major Market, Technical, Psychological, or Fundamental indicators to be analyzed. This selection produces another menu that contains the actual indicators available for analysis.

For example, if you select item nine, the Fundamental Market Indicators–Daily, from the Master Menu (Figure 5), a new menu will appear allowing you to select up to three indicators for further analysis. Figure 6 shows the possible choices of analyses when a Major Market Indicator is to be analyzed, including comparison, moving average, percentage change, and divergence analysis plots.

Figure 7 is a comparison plot showing how the Dow Jones Industrial average compares with the NASDAQ OTC market indicator during the period 5/2/83 to 7/29/83. You can easily see that the Dow was on a fairly level trend during this period while the OTC market gained momentum in the early part of the period and then lost ground.

Figure 8 shows a plot of the Dow Jones Industrial average and its 5- and 30-day moving average. According to Personal Equity Computing, by studying the market in relation to its 5-, 10-, 30-, and 150-day moving average you can get an indication of bullish or bearish overtones in the market. Section II and its appendix give information on how to interpret a graph of the indicators in relation to their moving averages.

Figures 9 and 10 respectively show the graphic output from the *Market Trend Analysis System* for percentage change and divergence analysis plots. Again, Section II of the manual discusses how to put this information to use in predicting market trends.

In the percentage change analysis, you have the option to specify any indicator and any point in history where data are available to start computing the percent difference points to be plotted.

In the divergence analysis, you can specify a point in time on one indicator and have the system compute and graph the percent change points for another indicator. Using 5/2/83 as a reference point in

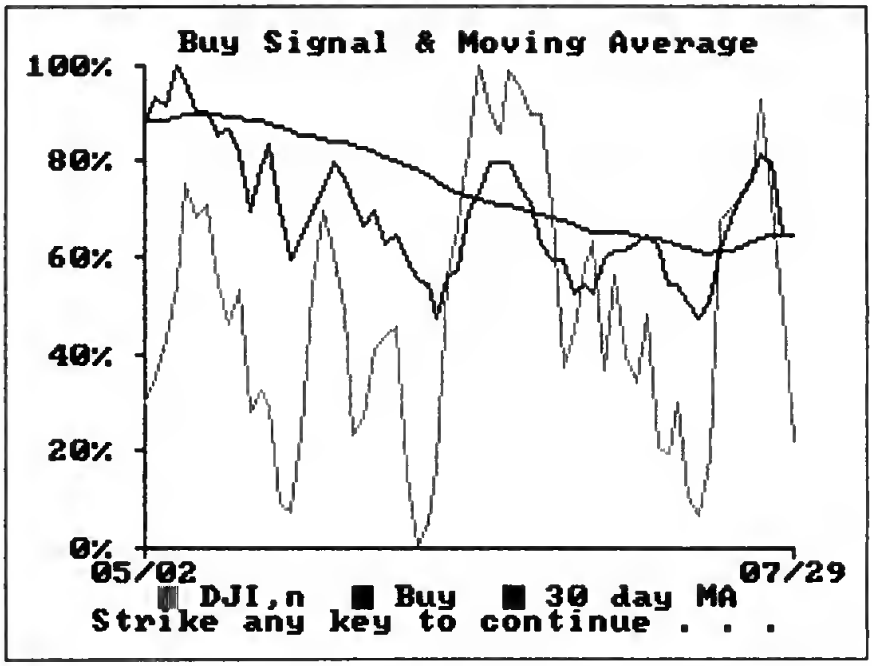


Figure 12: *Graph produced by the* Buy/Sell Trend Analysis System *showing a plot of the Dow Jones Industrial average (adjusted), the "percent buy" plot, and a 30-day moving average of the "percent buy" series.*

PEMS (TM) Market Buy/Sell Analyzer 04-25-1984

	DJI	Ref.	BUY/SELL Buy	BUY/SELL Sell	MARKET BOTTOM Buy	MARKET BOTTOM Sell
05/02/83	1204.33	08/12/82	88.1%	11.9%	23.3%	76.7%
05/03/83	1208.01	08/12/82	93.2%	6.8%	23.3%	76.7%
05/04/83	1212.65	08/12/82	91.5%	8.5%	30.0%	70.0%
05/05/83	1219.72	08/12/82	100.0%	0.0%	23.3%	76.7%
05/06/83	1232.59	08/12/82	96.6%	3.4%	36.7%	63.3%
05/09/83	1228.33	08/12/82	89.8%	10.2%	40.0%	60.0%
05/10/83	1229.68	08/12/82	89.8%	10.2%	40.0%	60.0%
05/11/83	1219.72	08/12/82	84.7%	15.3%	30.0%	70.0%
05/12/83	1214.40	08/12/82	86.4%	13.6%	36.7%	63.3%
05/13/83	1218.75	08/12/82	81.4%	18.6%	26.7%	73.3%
05/16/83	1202.98	08/12/82	69.5%	30.5%	20.0%	80.0%
05/17/83	1205.79	08/12/82	78.0%	22.0%	23.3%	76.7%
05/18/83	1203.56	08/12/82	83.1%	16.9%	23.3%	76.7%
05/19/83	1191.37	08/12/82	69.5%	30.5%	20.0%	80.0%
05/20/83	1190.02	08/12/82	59.3%	40.7%	13.3%	86.7%
05/23/83	1200.56	08/12/82	64.4%	35.6%	20.0%	80.0%

Strike any key to continue or ESC to exit . . .

Figure 13: *Table showing "percent buy" amounts during a 3-week period, computed by the* Buy/Sell Trend Analysis System.

the OTC market, the general downward trend of the graph shown in Figure 10 indicates that the Dow is, relatively speaking, performing more weakly than the OTC market. You can also see this trend in the Comparison Plot shown in Figure 7 where the OTC and the DOW are graphed together.

A Well-Informed System

The *Market Trend Analysis System* contains a tremendous amount of data. In all, 87 indicators are maintained and tracked. You can buy the data directly from Personal Equity Computing on monthly disks or you can download the data from its on-line computer as you need them for $60 per quarter. The procedures for collecting and updating *Market Trend Analysis System*'s data either via disk or on-line database are straightforward and simple.

Personal Equity Computing offers support via telephone. The developers of the PEMS system are knowledgeable in its use and in the interpretation of the results produced by the system. They seem anxious to help investors with questions on system usage.

The *Buy/Sell Trend Analysis System* is the second program in the PEMS series. It works with the *Market Trend Analysis System* to extend the capabilities of the overall PEMS system. It is designed to provide the PEMS user with information in two major areas: helping the investor determine when to get into or out of the market and helping the investor detect when the market has reached a "bottom" point at which it is likely to begin a substantial upswing. You must already have the *Market Trend Analysis System* to make use of the *Buy/Sell Trend Analysis System*.

The options displayed in the master menu for the *Buy/Sell Trend Analysis System* allow you to run a program that computes Buy/Sell analysis data points and Market Trend analysis data points for each day for which you have market data. With two of the options, you can display the results of both the Buy/Sell and Market Bottom analyses.

When Bear Turns to Bull

The Market Bottom Analysis is a procedure that can be run in addition to the Buy/Sell Analysis when the market is in a general decline (a "bear" market). In a bear market you are anticipating some bottoming-out point and are trying to predict when it will occur, so analysis is useful in this type of market. The Market Bottom Analysis would be obviously meaningless in a bull market.

As you have probably deduced, the purpose of the Market Bottom Analysis is to help the investor determine when the low or "bottom" point in the market average will occur. When you suspect that the bottom is near and you also get a strong buy signal from the Buy/Sell Analysis, that, according to the developers, is the time to be aggressive in your investing.

Figure 11 shows options for the various output graphs and tabulations available. The interpretation of the graphs and reports of all of these analyses are discussed in more detail in the manual.

Figure 12 shows the graph of the Dow Jones Industrial average (which has been adjusted for the percent scale and superimposed on it for comparison purposes). Also shown in the graph are a series of buy/sell signals (shown in percent) and the 30-day moving average of this series of buy/sell signals.

The heart of the *Buy/Sell Trend Analysis System* is the program that computes the buy/sell percent signals by comparing the value of 36 of the individual indicators used by the *Market Trend Analysis System*. Some of these indicators are weighted, with factors of 2 or 3 for those indicators the developers of the program consider important. Factors considered most important get a factor of 3. Those of "regular" importance get a factor of 1. If one of the 36 indicators used by the buy/sell analyzer is favorable (this "favorable" point for each of the 36 indicators is determined by the developers of the system), 1, 2, or 3 points are added to the "buy" count depending on the weight applied. If the indicator is not favorable no points are added to the "buy" count. When all indicators are evaluated and all points totaled, the "percent buy" figure is calculated as the ratio of the total "buy" count to the total points possible. This "percent buy" is calculated for each day the market is open. The results of the calculation of the "percent buy" for each day between 5/2/83 and 7/29/83 are plotted on the graph in Figure 12. For reference, a table showing the values of the percent signals during the first few days (5/2/83 through 5/23/83) is shown as well. (See Figure 13.)

The manual does a good job of explaining how to interpret tables and graphs like those shown in Figures 12 and 13.

The process used by the developer seems to me to be on the surface, a good overall approach for yielding a meaningful composite point (the "percent buy" value for a given day) of the indicators being analyzed. The manual explains how the "percent buy" points are derived and how to interpret the graphs and tables. Much of the information presented in the manual to explain how the graphs and tables are interpreted is presented as case studies from recent points in the Dow's history. For example, the Dow "bottom" of August 1982 is presented to illustrate how one interprets the results of the Market Bottom Analysis.

Investing Wisely

All three packages will require a few days of start-up time. The packages are not difficult to use. The mechanics of collecting the data, running the analyses, and producing the reports and graphs are straightforward and easily accomplished. However, you must be prepared to invest some time in understanding and interpreting the results of the analyses.

The potential income you could realize from the correct interpretation of the results produced by these packages can make the hours you invest in learning to use them extremely worthwhile. ■

Sticking To FUNDAMENTALS

I must admit that I am not much of a sports fan, but even I remember Vince Lombardi, one of the all-time great coaches of professional football. Lombardi believed strongly in the fundamentals of football. He drilled his championship teams day after day in blocking, tackling, and running. He believed that a team that knew the game's fundamentals would be a winning team.

Many members of the investment community believe as strongly as Lombardi did in fundamentals of a slightly different but related kind. These "fundamentalists" believe that if a company's "fundamental" income statement and balance sheet statistics are "in line," it will, in the long run, be a profitable investment.

Fundamentalists analyze these statistics to help them decide which common stocks to buy. Many software packages are available to help you perform the same types of analyses as professionals do. But before I review them, let's first look at the process of analyzing a company's fundamentals—this background information will give you a better feel for the purpose and function of the software I discuss later.

Fundamental analysis is a discipline that has been practiced since the 1930s to screen and select common stocks for investment. During the screening process, you extract information (called fundamental indicators) from various companies' income statements and balance sheets and produce financial statistics, which you then compare against your screening rules.

Screening Rules

You develop your screening rules according to your own investing criteria and the degree of risk you are willing to accept. A sample set of stock screening rules for identifying potential investments is shown in Figure 1.

Once you identify the stocks that meet the five screening rules shown in Figure 1, you can specify additional rules or more restrictive versions of the first five to produce a more selective subset of "acceptable" stocks. When your screening rules become restrictive enough to produce a list of manageable stocks, say 50 or so, you can then produce a report showing important statistics (for example,

Illustration: Mark Penberthy

Software packages for the PC can help "fundamental" stock market analysts screen stocks. Two use on-line data, while a third uses monthly data disks.

the 5-year growth rate in earnings) for each company. You make your final selections by scanning this report and combining the information with other fundamental data you may have about each company that cannot be easily quantified (for example, its management's expertise or the viability of its current or planned products).

As you can see, this process is highly analytical and includes many computations. You can imagine what a task it would be to manually screen 6,000 or more public companies.

Your PC Can Help

Since the personal computer can solve algebraic equations and make yes-no decisions much faster than you can, it should allow you to screen many more stocks than you can by manual analysis. If you can screen more stocks, you stand a better chance of selecting the best ones for investment because the universe you can consider is greater. However, to screen a large number of stocks you need computer-readable data. Companies like Standard & Poors Corporation and Value Line, Inc., have supplied investment information in electronic form for many years. With this electronically accessible financial data and a fundamental analysis software package, you can perform the same investment analyses that the large brokerage houses do so successfully.

Dow Jones Market Microscope

The *Dow Jones Market Microscope* is one of several available stock-screening software programs that use fundamental analysis as the basis for stock selection. Dow Jones & Company publishes and distributes two other stock market analysis packages: the *Market Analyzer* (technical analysis/charting), and the *Market Manager* (portfolio management). Dow Jones also offers the Dow Jones News/Retrieval service, which supplies price quotations and company statistics. All three of the Dow Jones packages will automatically connect to and transfer information on the News/Retrieval service to your PC.

The *Market Microscope*, the Dow Jones fundamental analysis package, allows you to specify up to 20 fundamental indicators to be used in ranking a list of stocks that you specify. The Buy Screen report (Figure 2) and the Buy Screen Rank Matrix report (Figure 3) are used to assist you in deciding which stocks from the reports to buy or sell. Here's how this stock selection process works.

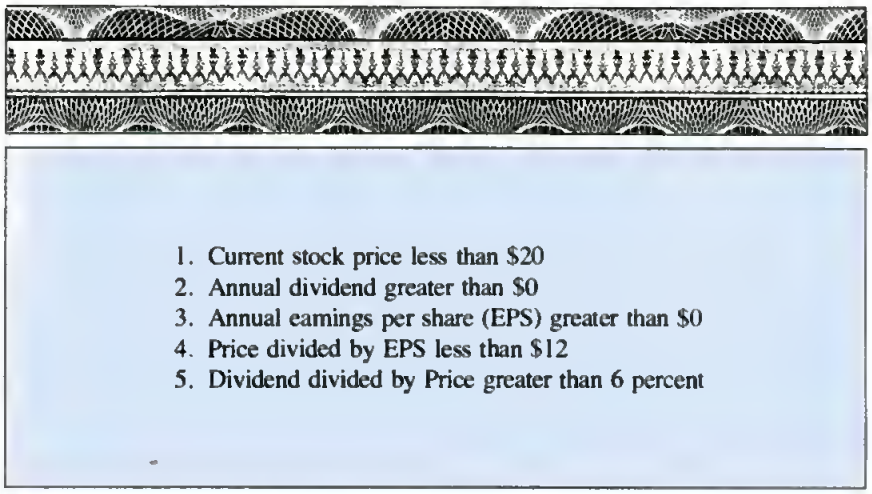


Figure 1: *An example of a set of investor-defined screening rules for identifying stocks that merit further fundamental analysis.*

Before you begin, you must have access to key company financial statistics (the fundamental indicators) for each stock you consider. The *Market Microscope* links to the Dow Jones information utility, which maintains 68 fundamental indicators (updated weekly) for thousands of companies.

To use this information, you select the option to Create or Edit Stock and Industry Lists from the program's main menu. A submenu allows you to specify stocks according to Standard Industry Codes (SIC codes) or another list of stocks of your own making. Within the list, you specify the specific stocks you want to include in your analysis.

Then you Select a Set of Indicators from a submenu that gives you access to the 68 fundamental indicators maintained on the News/Retrieval service. You can select up to 20 of the 68 indicators to be used in the Buy Screen Rank Matrix or the Buy Screen reports.

If you need indicators that are not on the list of 68, you will have to use some other method to get the data. You cannot use combinations of the 68 indicators to compute other ones. For instance, if you wanted to rank the stocks based on their company's total assets minus their total debt, divided by their number of shares outstanding, you would not be able to calculate this indicator for use in the stock ranking process. You might decide that debt to equity ratio (one of the 68 indicators in the database), is an acceptable substitute for your custom-designed indicator. Then your analysis could be performed totally within the *Market Microscope* package.

The 68 indicators Dow Jones supplies give you quite a wide array of information, so chances are good you'll find the ones you need for your analysis. (The appendix to the *Market Microscope* manual lists the 68 indicators and describes what they mean.)

Once you have chosen your indicators and your stocks, you then go on-line with the Dow Jones News/Retrieval service host computer (Choose the Access Dow Jones Data Bases option from the main

menu) to extract the indicators for each of the stocks you have selected. If you have a modem with auto-dial, the software will make the connection and extract the data automatically. Even if you do not have an auto-dial modem, the program knows where to look in the Dow Jones database to extract the data you need. You do not have to spend a great deal of expensive connect-time looking through the database. You can sit back and watch your PC find the data you need and write it to disk.

To screen your stocks, you then select the criteria limits for each indicator. You pick the Screening Stocks and Industry Groups option from the main menu and the Specify a Buy Screen option from the submenu. The process is straightforward and takes only a few minutes. The information you specify is used to prepare the Buy Screen Rank Matrix shown in Figure 3. Finally, the Buy Screen is produced by selecting the Screen a List for Buying option in the same submenu you used to define the screening criteria limits.

As you can see, the *Dow Jones Market Microscope* is actually a stock ranking program rather than a stock screening program. Rather than selecting certain stocks that meet prescribed screening rules, the package requires you to specify stocks you are interested in and then ranks them for each indicator specified. It does not allow you to specify the screening rules and select stocks from the News/Retrieval service that meet those criteria. This is the package's most serious shortcoming. On the other hand, it does produce ranked lists of stocks, allowing you to exclude those that fall below a screening rule limit. So it is still a useful tool for fundamental analysis and can save you a considerable amount of time and effort.

VALUE/SCREEN

The *VALUE/SCREEN* program from Value Line, Inc., is a fundamental analysis stock screening program that uses a database of fundamental indicators supplied monthly on a disk instead of through an on-line database. It is a powerful and flexible program that allows you to screen for stocks based on your screening rules. It includes an extremely useful reporting module that allows you to produce custom reports formatted according to your specifications.

To use the *VALUE /SCREEN* program, you load the program disk in one disk drive and the data disk in another drive (neither the data nor program can be copied to a hard disk). Then select the Begin Screening option from the main menu. A screen that looks like Figure 4 will appear. (All of the 32 fundamental indicators shown in Figure 4 are fully explained in

```
NONE========================== BUY SCREEN ==========================

   COMPUTERS,SYS.,PERIPH.          (170)  -  04/06/84          04/17/84

A. CURRENT P/E RATIO.....................LOW TO HIGH   LIMIT: 10
                                                       ICF: 14.0
   CONTROL DATA CORP                CDA          8.3
   >
   INTERNATL BUSINESS MACH          IBM         12.1
   AUTOMATIC DATA PROCESS'G         AUD         16.1
   DIGITAL EQUIPMENT CO             DEC         19.8
   APPLE COMPUTER INC               AAPL        24.7
   DATA GENERAL CORP                DGN         37.8

B. 5YR EPS %GROWTH RATE..................HIGH TO LOW   LIMIT: 20
                                                       ICF: 15.0
   APPLE COMPUTER INC               AAPL        71.0
   >
   AUTOMATIC DATA PROCESS'G         AUD         19.0
   INTERNATL BUSINESS MACH          IBM         15.0
   CONTROL DATA CORP                CDA         11.0
   DIGITAL EQUIPMENT CO             DEC          7.0
   DATA GENERAL CORP                DGN        -14.0

C. INSIDER NET TRADING(1000SHRS).........HIGH TO LOW   LIMIT: ICF
                                                       ICF: -1015
   APPLE COMPUTER INC               AAPL         10
   DIGITAL EQUIPMENT CO             DEC           6
   AUTOMATIC DATA PROCESS'G         AUD          +0
   DATA GENERAL CORP                DGN          +0
   INTERNATL BUSINESS MACH          IBM          -7
   CONTROL DATA CORP                CDA          -9
   >

D. EST EPS %GROWTH PRESENT FY............HIGH TO LOW   LIMIT: 15
                                                       ICF: NONE
   DATA GENERAL CORP                DGN       133.33
   CONTROL DATA CORP                CDA        18.33
   AUTOMATIC DATA PROCESS'G         AUD        17.20
   INTERNATL BUSINESS MACH          IBM        15.71
   >
   DIGITAL EQUIPMENT CO             DEC         7.20
   APPLE COMPUTER INC               AAPL      -37.50
```

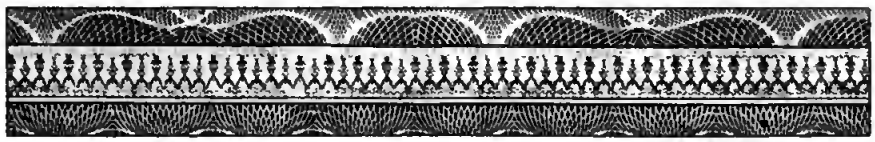
Figure 2: *Buy Screen from the* Dow Jones Market Microscope.

the manual.) You select the indicators to be considered in your criteria and specify criteria limits for each indicator you select. In defining screening criteria, you are also allowed to compare one indicator with another or with a constant multiplied by another indicator. This feature is useful for creating such screening rules as "Recent price is less than 75 percent of 12-month high price" (that is, price of a stock must be at least 25 percent below the highest price in the past 12 months).

When the screening rules are set, you just strike the Return key twice and screening begins immediately. The program searches rapidly through the database (a full search takes less than a minute). The program reports how many stocks have been examined and how many stocks have passed the screen. You can revise the screening criteria (making it either more or less restrictive) to include a smaller or larger set of stocks for future reports.

Reporting is straightforward and flexible. In effect, any variable or combination of variables can be reported. You can sort for any indicator in the database. You can get only up to seven columns of data in one report, but you can produce multiple reports with different variables in each report.

VALUE/SCREEN is a fast fundamental analysis screening package that can save you hundreds of hours in screening and analysis time.



```
========================== BUY SCREEN RANK MATRIX ==========================

   COMPUTERS,SYS.,PERIPH.          (170)  -  04/06/84                  04/17/84

A. CURRENT P/E RATIO.......................LOW TO HIGH   LIMIT: 10

B. 5YR EPS %GROWTH RATE....................HIGH TO LOW   LIMIT: 20

C. INSIDER NET TRADING(1000SHRS)...........HIGH TO LOW   LIMIT: ICF (-1015 )

D. EST EPS %GROWTH PRESENT FY..............HIGH TO LOW   LIMIT: 15

SYMBOL  A  B  C  D  ABCD
AAPL    5  1  1  6  .!!.
AUD     3  2  3  3  ..!!
CDA     1  4  6  2  !.!!
DEC     4  5  2  5  ..!.
DGN     6  6  4  1  ..!!
IBM     2  3  5  4  ..!!

#>LIM   1  1  6  4
#COMP   6  6  6  6
```

Figure 3: *Buy Screen Rank Matrix from the* Market Microscope.

```
1 TIMELINESS          9 RECENT PRICE        17 3-5 YR APPREC %      25 5-YR EPS GROWTH
2 SAFETY             10 CURR P-E RATIO      18 3-5 YR TOT RTN       26 5-YR DIV GROWTH
3 INDUSTRY RANK      11 CURRENT DIVD YLD    19 PROJ 3-5 YR EPS      27 5-YR BOOK GROWTH
4 PRICE STABILITY    12 CURRENT E.P.S.      20 PROJ 3-5 YR DIV      28 % RTN/NET WORTH
5 FINL STRENGTH      13 CURRENT DIV/SH      21 PROJ 3-5 YR BV/SH    29 % RETD/EQUITY
6 BETA               14 PRICE/BOOK VAL      22 PROJ EPS GROWTH      30 ANNUAL SALES
7 12-MO HIGH PRICE   15 DEBT/CAPITAL        23 PROJ DIV GROWTH      31 INDUSTRY CODE
8 12-MO LOW PRICE    16 MARKET CAPITLZTN    24 PROJ BV/SH GROWTH    32 FISC YR-END DATE

                                                  MM/YY
          VARIABLE          <=>                   VALUE          # OF STOCKS
  INPUT NUMBER-->

.......................................................................................
        INPUT # OF ITEM AND PRESS (RETURN); OR PRESS (RETURN) TO EXIT
```

Figure 4: *The list of fundamental indicators available in* VALUE/SCREEN.

Head to Head

One of the major differences between *VALUE/SCREEN* and the *Dow Jones Market Microscope* is that *VALUE/SCREEN* allows you to separate the stocks that successfully pass the screening rules from the ones that don't. Once the stocks that pass the screening rules are identified, custom reports containing information on only the screened stocks can be produced. This is an important difference because you are able to screen all of the stocks included in the *VALUE/LINE* database rather than just the stocks or industry groups you specify. The *Dow Jones Market Microscope* could accomplish the same thing by specifying that the lists you search for contain all industry groups, but this approach would not be practical because the cost of screening is based on connect-time and it would be expensive to select all the stocks in the database. The *Market Microscope* was not designed to screen the entire Dow Jones database.

Another major difference is in the method used to distribute the data to you. *VALUE/SCREEN* searches a database on disk rather than on-line. The *VALUE/SCREEN* monthly disk contains information on 1,650 stocks, many fewer than you can access with the Dow Jones databases. The *Market Microscope* can access information on over 3,200 companies in the Media General Financial Services and Disclosure II databases and 2,400 companies in the Corporate Earnings Estimator database. The 68 indicators available in

Fundamental Facts

A listing of some of the available fundamental analysis software packages.

Dow Jones Market Microscope
Dow Jones Spreadsheet Link
Dow Jones & Company
P.O. Box 300
Princeton, NJ 08540
(800) 257-5114
List Price: *Market Microscope,* $699; *Spreadsheet Link,* $249.
Requirements: *Market Microscope:* 128K RAM, DOS 1.1, RS-232-compatible modem, asynchronous adapter. *Spreadsheet Link:* depends on those for spreadsheet. At minimum, 128K RAM, one double-sided disk drive, acoustic coupler or 300/1000-baud modem, asynchronous adapter.

CIRCLE 699 ON READER SERVICE CARD

VALUE/SCREEN
Value Line, Inc.
711 Third Avenue
New York, NY 10017
(212) 687-3965
List Price: $495 per year (includes database on monthly disks).
Requires: 64K RAM, two disk drives, printer optional.

CIRCLE 700 ON READER SERVICE CARD

STOCKFOCUS
Centennial Software, Inc.
1873 South Bellaire St., Suite 510
Denver, CO 80222
(800) 525-2003
List Price: $59.95
Requires: 64K RAM, one disk drive, printer desirable.

CIRCLE 702 ON READER SERVICE CARD

Market Maverick
Financial Software, Inc.
11401 Westridge Circle
Chardon, OH 44024
(800) 392-2669
List Price: $275; $120 per year for monthly database disk and newsletter.
Requires: 128K RAM, one double-sided disk drive, printer and modem optional.

CIRCLE 703 ON READER SERVICE CARD

Micro PMS
The Boston Company
One Boston Place
Boston, MA 02106
(800) 468-8324
List Price: Portfolio accounting package, $95; Database and analysis package, $395 per year for monthly disks, $250 per year for quarterly disks.
Requires: 128K RAM, two disk drives.

CIRCLE 701 ON READER SERVICE CARD

The Evaluation Form
Investor's Software
Box N
Bradenton Beach, FL 33510
(813) 778-5515
List Price: Version 1, $80; Version 2, $100
Requirements: 64K RAM, one disk drive, printer recommended.

CIRCLE 704 ON READER SERVICE CARD

Micro/Scan
Isys Corporation
50 Church St.
Cambridge, MA 02138
(617) 491-6221
List Price: $6,250 per year and up for monthly disks, depending on which of five available databases you want.
Requires: 256K RAM, two disk drives, printer optional.

CIRCLE 705 ON READER SERVICE CARD

Stockpac II
Standard & Poors Corporation
25 Broadway
New York, NY 10004
(212) 208-8000
List Price: $245 to $1,000 per year including monthly database disks, depending on databases chosen.
Requires: 128K RAM, one double-sided disk drive, graphics card to view graphs.

CIRCLE 707 ON READER SERVICE CARD

Stock Portfolio System
Smith Micro Software, Inc.
P.O. Box 7137
Huntington Beach, CA 92615
List Price: $185
Requires: 128K RAM, one double-sided disk drive or hard disk.

CIRCLE 666 ON READER SERVICE CARD

the Dow Jones package are a more comprehensive set than the Value Line package's 32 indicators.

The relative costs of these two packages depend on how often you need to use the databases. The Dow Jones package accesses price quotes and trading volume data from the Dow Jones Quotes database, estimated corporate earnings from the Corporate Earnings Estimator database, and the rest of the data used in the analysis from the Disclosure II database. At a 300-baud data transfer rate, the price for accessing these databases ranges from $.10 to $1.20 per minute depending on the time of day, database you are using and type of service you have (Standard, Blue Chip or Executive). For volume users, the least expensive way to access the data is to connect to the service only in non-prime-time hours (6:01 p.m. to 4:00 a.m. or on weekends or holidays) and pay an annual subscription fee of $100 for the Executive service. Under that arrangement, quotes cost only 10¢ per minute, and all other data cost 60¢ per minute. There is a flat $2 charge for each company accessed through the Disclosure II database. The monthly Value Line disk service costs a flat $495 for a 12-month subscription (includes price of the original software).

Use of electronic databases will increase tremendously as more and more investors discover how much less time and effort it takes to perform fundamental analyses with a personal computer than to do them by hand. Although consumers have no individual control over the prices of these services, it is logical to assume that the cost (particularly of those with lower variable costs) will decrease as the volume of subscribers increases.

Which of these two packages is best for you? The answer depends on your analysis preferences and frequency of analysis. If you need to screen the stock database only occasionally and you know which stocks and industry groups you want to follow, the Dow Jones package may be better for you. If you want to screen all stocks and get custom-designed reports on those that meet your criteria, the Value Line package is probably the better choice.

For my style of investing (which may be quite different from yours), I need to screen all stocks and then narrow further analysis to only those stocks that are of particular interest to me. Therefore, I would pick the Value Line over the Dow Jones package. However, if I did my screening analysis, say, only once a year and then bought and held the stocks for

VALUE/SCREEN allows you to separate the stocks that pass the screening rules from the ones that don't and produce reports on only the screened stocks.

investment, I would go with the Dow Jones package because of its lower cost for the infrequent user.

Dow Jones Spreadsheet Link

A number of other fine fundamental investment analysis packages are also on the market, but I cannot adequately cover them all here. However, another package from Dow Jones called the *Dow Jones Spreadsheet Link* deserves special mention. The *Spreadsheet Link* is a utility package that links the data in the Dow Jones News/Retrieval databases to *Multiplan*, *1-2-3*, and *VisiCalc*. Although it is not a fundamental analysis package per se, it can be used effectively for fundamental analysis and allows you to formulate even the most complicated of fundamental analysis indicators. As with the *Market Microscope* package, you have to know what stocks you want to work with in advance, but once the stocks have been identified you can manipulate the "fundamentals" of these stocks in any way you want and then rank them by any selection criteria using the sorting and computation capabilities of the spreadsheet. The *Spreadsheet Link* software would be a useful addition to your fundamental analysis software tool kit because it links the power of the spreadsheet with useful data found in the Dow Jones database. The flexibility this product gives you is almost unlimited!

Conclusion

With the wealth of good fundamental analysis packages either already available or soon coming to market, you should be able to find a program and data source that meets your particular stock selection and analysis needs.

The list of vendor addresses, packages and prices in the sidebar *(Fundamental Facts)* is probably not complete because packages that do fundamental analysis are being introduced rapidly. Standard & Poors has just released *Stockpac II* for the IBM PC. The program, which is excellent, has previously been available only for Apple computers. It should be equally good (and also faster) on the PC.

Fundamental analysis packages will quickly repay their cost through the time they save you in screening and analysis. They will also allow you to perform analyses that you would not attempt by hand, thereby providing considerably more information for your stock selection decisions than you would otherwise have. The chances are good that fundamental analysis software will help you make more profitable stock investing decisions. Without a doubt, you will be able to make more intelligent decisions with the added information they provide. ■

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- A dedicated approach to honest customer service

Micro Flash Guarantee

- We sell the latest versions
- We support what we sell
  We won't tell you to call the publisher or manufacturer for after-sale support.
  We want you to call us!
- We won't sell you anything we don't think you need
- If the product is defective when you receive it — we'll replace it!

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- Call our Credit Manager for information on institutional purchase orders
- All returns must have a Return Authorization Number
- $100.00 minimum order
- Products and prices subject to change without notice

Micro Flash Shipping

- $6.00 for UPS surface (except for printers and monitors)
- Add $3.00 per item for UPS 2nd Day Air
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Panasonic Half-Height Drives	495.00	189.00
Paradise Multidisplay Card	589.00	489.00
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Princeton Graphics		
Max-12 Amber Monitor	249.00	189.00
HX-12 Hi-res RGB Monitor	895.00	524.00
SR-12 Super Hi-res RGB Monitor	799.00	629.00
Scan Doubler	249.00	214.00
PTI Gateshield Power Supply	359.00	329.00
Quadram Expandable Quadboard	295.00	239.00
Diskettes — 3M, Dysan, Others		$CALL$

SOFTWARE		
Ashton-Tate dBase II*	$ 700.00	$379.00
FRAMEWORK	695.00	549.00
BPI Systems Accounting* (ea. mod.)	595.00	398.00
Continental Home Accountant Plus*	150.00	84.00
DayFlo (for IBM PC XT)	495.00	371.00
Fox and Galler QUICKCODE*	295.00	179.00
Human Edge Sales Edge	250.00	198.00
Microrim Inc. R:base 4000	495.00	349.00
Microsoft* Multiplan™*	195.00	148.00
Multi-Tool™ Word with Mouse	495.00	348.00
Multi-Tool™ Cash Plan	125.00	94.00
Basic Compiler*	395.00	278.00
Business Basic Compiler	800.00	418.00
C Compiler	500.00	349.00
Pascal Compiler	300.00	224.00
Fortran Compiler*	350.00	244.00
Cobol Compiler*	700.00	518.00
Sort Facility*	195.00	148.00
Macro Assembler	100.00	74.00
Project	250.00	198.00
Microstuf Crosstalk XVI	195.00	119.00
MultiMate Int'l MultiMate	495.00	298.00
Peter Norton Utilities	80.00	55.00
RoseSoft ProKey Vers 3.0	129.95	95.00
SPI Open Access	595.00	475.00

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Davong MacDisk 10 MB	$2395.00	2059.00
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COVER STORY/ERIC FREEDMAN

From Wall Street To Your Street

When you marry the analytical and number-crunching capabilities of the PC to the upscale demographics of most PC users, the result is a plethora of software programs designed to help personal computer users better monitor their money, property, and other assets.

INVESTMENT MANAGER and *Dollars and $ense* are among the progeny of that marriage. Each is intended to assist you in managing your money. But like human siblings who sometimes bear little physical or personality resemblance to each other, these programs have more differences than similarities. While *Dollars and $ense* is a powerful and versatile version of the common budgeting and balancing program, *INVESTMENT MANAGER* ventures into exotic territory—handling stocks, bonds, and other investments.

Are we making money or losing our shirts? How do we know what kind of return we're getting from dividends and interest? Does the selling price mean a capital gain or capital loss? There must be a better way to monitor our investments than to draw columns on ruled notebook paper and enter the market quotes every week by pencil.

INVESTMENT MANAGER is a hybrid package intended to replace the pencil with a PC. It combines a specialized database management program for maintaining securities portfolios with a telecommunications mode for accessing market prices and automatically updating those portfolios through Dow Jones News/Retrieval and Warner Computer Systems.

A computer-based portfolio management system isn't for everyone. If you've got 12 shares in Mississippi Asbestos, Ltd. inherited from your great uncle, two U.S. Savings Bonds left over from high school graduation, and a money market fund, you're better off investing the cost of *INVESTMENT MANAGER* in something else. This type of program is more suited

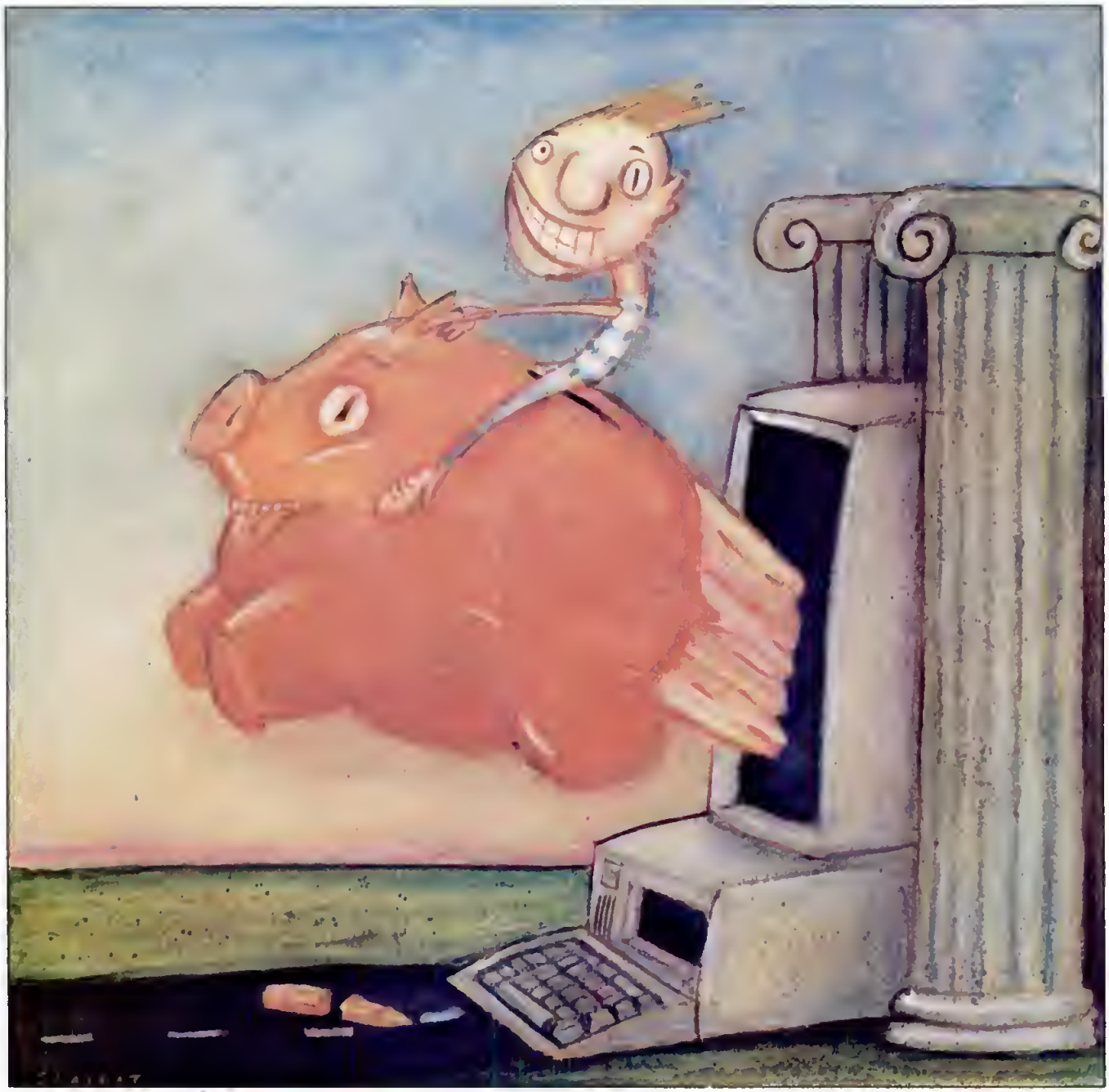

Illustration: Andrew Shachat

INVESTMENT MANAGER will keep tabs on the welfare of your stocks and bonds, while Dollars and $ense keeps your checkbook and home finances healthy.

for the serious investor with a variety of holdings, for the dabbler with small amounts invested in different companies, for an investment club, for someone who enjoys tracking hypothetical investments, or for a teacher who wants to give students a look at economics.

INVESTMENT MANAGER is a few-frills, monochrome, menu-driven program. A major plus is the lack of commands to memorize or look up. Relevant keys are shown on the appropriate screen, and most functions require few keystrokes. Selecting from the nine-item main menu (Figure 1) leads you to submenus.

The database portion of the program maintains data on stocks, bonds, and similar investments, including purchase price, date of acquisition, corporate name, stock exchange symbol, number of shares, recent market quotations, and dividends or interest received. It will also indicate whether a holding listed in the portfolio is "closed," or sold. There's no field in which to list brokerage fees.

If you're using *INVESTMENT MANAGER* to monitor a family's holdings, you can keep them together or easily create separate portfolios for each spouse and child. If you forget what's in a particular portfolio, go to the Portfolio Files Utilities menu to select Review Securities on Disk.

Data entry is easy. After selecting the Enter New Securities option from the menu by pressing N, you're prompted to enter the portfolio name; whether the security is a stock, bond, or other; its trading symbol; the number of units purchased;

PC FIRST FILE

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IMSI
633 Fifth Ave.
San Rafael, CA 94901
(415) 454-7101
List Price: $275
Requires: 128K RAM, two disk drives, PC-DOS. Printer and modem optional.

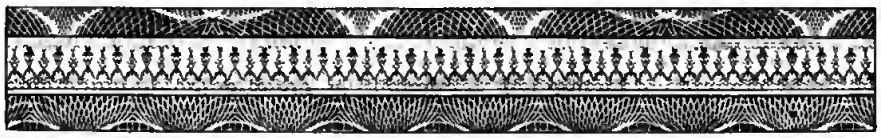
CIRCLE 694 ON READER SERVICE CARD

```
SECURITY PERFORMANCE APPRAISAL: MAIN MENU
DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD

        N        ENTER NEW SECURITIES

        S        SELL SECURITIES

        Q        ENTER MARKET QUOTES

        D        ENTER DIVIDENDS/INTEREST

        P        PRINT/DISPLAY PORTFOLIO REPORTS

        C        CALCULATE PORTFOLIO (Performance Report)

        U        PORTFOLIO FILE UTILITIES

        F        PORTFOLIO MACRO FUNCTIONS (Optional)

        X        TO EXIT PROGRAM

    PRESS LETTER TO INDICATE CHOICE
```

Figure 1: INVESTMENT MANAGER*'s main menu.*

```
                    INVENTORY REPORT
                    PORTFOLIO NAME: FREEDMAN        page  1  04 22 1984

                                  PRICE/   INTEREST/      GAIN OR LOSS
NAME OF FIRM      UNITS   TL. COST   QUOTE    DIVIDENDS  LONG TERM    SHORT TERM
************      *****   ********   ******   *********  ************************

BONDS:

IBM 9.5% 1986        10     10,000     10,000      1425                       0
HONEYWELL 14.8%       5      5,075      5,875       435                       0
SPERRY 10.5%         10      9,025      9,500       948                     475
        TOTALS            $24,900    $25,375     2,807                    $475

STOCKS:

COLECO               85      4,250      4,250       275                       0
DIGITAL             100      6,570      6,570      1300                       0
IBM                  50      6,325      6,325       180                       0
IBM                  50      5,850      5,850       270                       0
TANDY               100      2,750      3,050       225          300
        TOTALS            $25,745    $26,045     2,250                    $300

OTHER:

DREYFUS 30 CENT     750      4,973      4,973      1368                       0
        TOTALS            $4,973     $4,973     1,368                      $0

GRAND TOTALS              $55,618    $56,393    $6,425          $0        $475
                                                TOTAL CAPITAL  GAIN        $775
```

Figure 2: *An inventory report in* INVESTMENT MANAGER.



```
                    PORTFOLIO PERFORMANCE REPORT
                    PORTFOLIO: FREEDMAN     04-22-1984
                    D & C POSITIONS

ENTIRE PORTFOLIO                          % RETURN        # OF SECURITIES
    TOTAL ANNUALIZED RETURN:                62.18                 9
    TL. BETA ADJ. RETURN:                   62.18                 9
    ANU. RETURN DIV./INTR.:                 55.49                 9
    ANU. RETURN CAP. ONLY.:                  6.69                 9

                         PORTFOLIO BETA:    0.247

                    TRANSACTIONS INDEX         11579

STOCK PORTION                             % RETURN        # OF SECURITIES
    TOTAL ANNUALIZED RETURN:                89.69                 5
    TL. BETA ADJ. RETURN:                   89.69                 5
    ANU. RETURN DIV./INTR.:                 79.14                 5
    ANU. RETURN CAP. ONLY.:                 10.55                 5

                          STOCK BETA:    1.000

                    TRANSACTIONS INDEX          2843

BOND PORTION                              % RETURN        # OF SECURITIES
    TOTAL ANNUALIZED RETURN:                37.63                 3
    ANU. RETURN DIV./INTR.:                 32.19                 3
    ANU. RETURN CAP. ONLY.:                  5.45                 3

                    TRANSACTIONS INDEX          0722

OTHER PORTION                             % RETURN        # OF SECURITIES
    TOTAL ANNUALIZED RETURN:             10041.63                 1
    TL. BETA ADJ. RETURN:                10041.63                 1
    ANU. RETURN DIV./INTR.:              10041.63                 1
    ANU. RETURN CAP. ONLY.:                  0.00                 1

                         OTHER BETA:    1.000

                    TRANSACTIONS INDEX            14
```

Figure 3: *A portfolio performance report generated by* INVESTMENT MANAGER.

```
                Main Menu


[ A ]  Define Accounts                      Account Disk: Writing
[ B ]  Modify Check Account Data
                                        Disk Extension Number.....0
[ C ]  Enter Transactions               Version...................5
[ D ]  Edit Transactions                Date Last Entry...........2/12/84
[ E ]  Transactions Report
[ F ]  Reconcile Bank Statement         Number of Accounts........31 of 120
                                        Number of Check Accounts..1 of 12
[ G ]  Prepare Reports                  Variable Budgets Used.....0 of 32
[ H ]  Prepare Graphs
                                        Number of Transactions....10
[ I ]  Account Disk Utilities           Amount of Disk Used.......3 Percent
[ J ]  Write Checks
[ K ]  Modify Configuration Parameters


DDDD
```

each time you want to log on. Once you're on-line, pressing the F2 key will automatically update the securities in the portfolio and then disconnect you.

The ability to decode the alien symbols on the financial pages of the newspaper won't necessarily prepare you for the illogical organization of the *INVESTMENT MANAGER*'s manual. For example, to set the parameters for installing the program to configure of your PC or XT, don't look at the beginning of the manual—turn to Chapter 4. At the beginning you'll find a tutorial "User's Guide," but it's difficult to work your way through the tutorial before you've configured the software.

Beyond the organizational drawbacks are more substantive and confusing difficulties. The illustrations in the manual, such as tbe inventory report, don't always correspond with what you'll see on the screen.

Another difficulty I encountered was with tbe word *beta*. I came across the word in the tutorial and again in the introduction, both times without a definition. It appears a third time in the step-by-step instructions for entering new securities, where you're simply told, "If you do not know the beta or you lack an understanding of beta theory, just push <CR> (carriage return) without typing anything else. The program will automatically assign all stocks a beta of 1 and all other securities a beta of 0." The long-awaited explanation finally appears on page 60: "Beta is a measurement of the price volatility of a particular investment" and can be obtained through Dow Jones or Value Line.

Other small but irksome problems include an on-line help function that doesn't help much, generally referring you to a section of the manual, and a rigid format for entering dates—if you forget to use two digits for the month or day, the error screen appears with a beep.

On tbe positive side, the program handles DIF files so you can transfer data between it and some spreadsheets, including *1-2-3* and *VisiCalc*. Its glossary explains computer and investment terms and it comes with a demonstration portfolio called DEMO, so you can experiment with data manipulation and reporting.

INVESTMENT MANAGER is noble in conception but flawed by birth defects. In deciding whether this program belongs among your software holdings, evaluate whether broader programs such as accounting or spreadsheet packages can do an adequate job of tracking your Wall Street holdings. In addition, balance the cost of subscribing to Dow Jones or Warner if you don't use those services, especially if you already subscribe to CompuServe or The Source, both of which carry stock market listings.

Dollars and $ense
Monogram
8295 S. La Cienega
Inglewood, CA 90301
(213) 215-0529
List Price: $165
Requires: 64K RAM, two disk drives (hard disk not supported), 80-column display, monochrome or color/graphics card. Color monitor and printer optional.

CIRCLE 695 ON READER SERVICE CARD

Home Financing

If your finances have little to do with Wall Street and everything to do with stretching your paycheck and balancing your checkbook, *Dollars and $ense* might be a sensible investment.

An accounting program should be easy to learn, but that's not enough to make a noticeable difference in how you handle personal or small business finances. A good program should also maximize your PC's capabilities and handle tasks that otherwise require tedious calculations—without requiring training as an accountant. *Dollars and $ense* meets that test, and at a reasonable price. Its functions include budgeting, checkbook balancing, generating reports, writing checks, and producing multicolor graphs. Budget management is the heart of *Dollars and $ense* as well as the jump-off point for the program's other features.

You will need at least two disks, one for the program and one for each set of accounts. Use the Account Disk Utilities item from the main menu (Figure 4) to initialize a data disk. You can use any of three predefined sets of accounts—business, household, and tax preparation—that come with appropriate categories of assets, liabilities, expenses, and income. You can modify any of those sets or create your own with a maximum of 120 monetary categories. You may also include an amount budgeted monthly for any of those categories, a tool that will help you analyze your spending patterns and improve your fiscal planning.

The right-hand half of the main menu screen is a status section for such information as the date of last entry, number of account categories in use (maximum 120), and percentage of the data disk used.

Once an account is defined you're ready to enter transactions through the main menu. Here you list expenditures, starting with the check number and followed by date, payee, account, taxable status, and amount. A typical entry would read,

```
#3512 10/19 North Pole
  Furniture, Inc.
Repairs/Maintenance T $225.
```

Check numbers are automatically recorded serially based on the starting number for the account, but you can override the default from the keyboard when, for example, a check was voided. You can also record multiple-purpose or split expenditures such as a single check to a computer store, part for office supplies and the remainder for hardware.

Deposits are entered with the source of income in the transaction mode. So are credit card charges, which are regarded as liabilities. The upper right-hand corner of the screen shows a running balance.

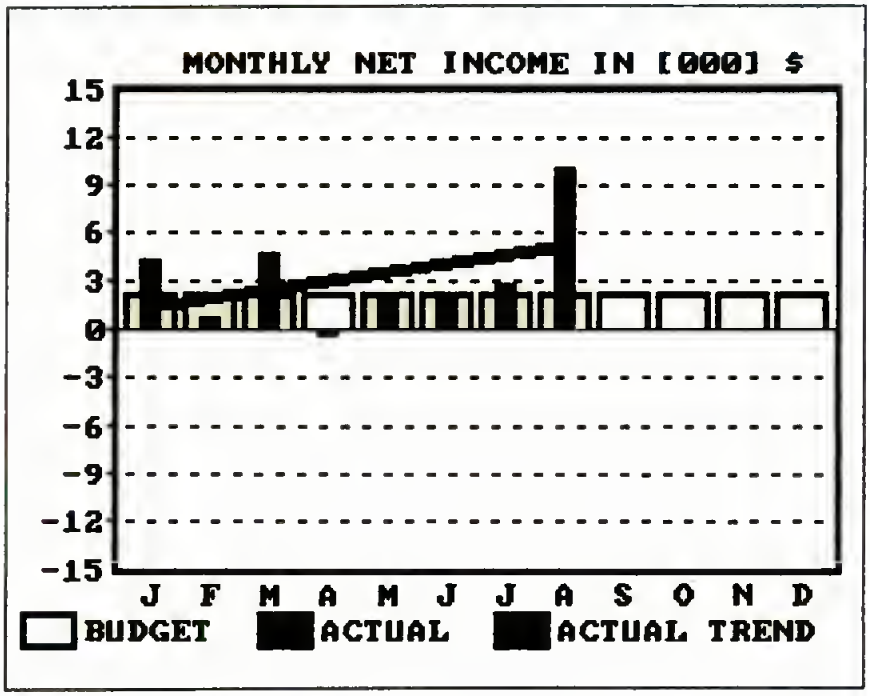


Figure 5: *A* Dollars and Sense *bar graph comparing monthly net income to a projection.*

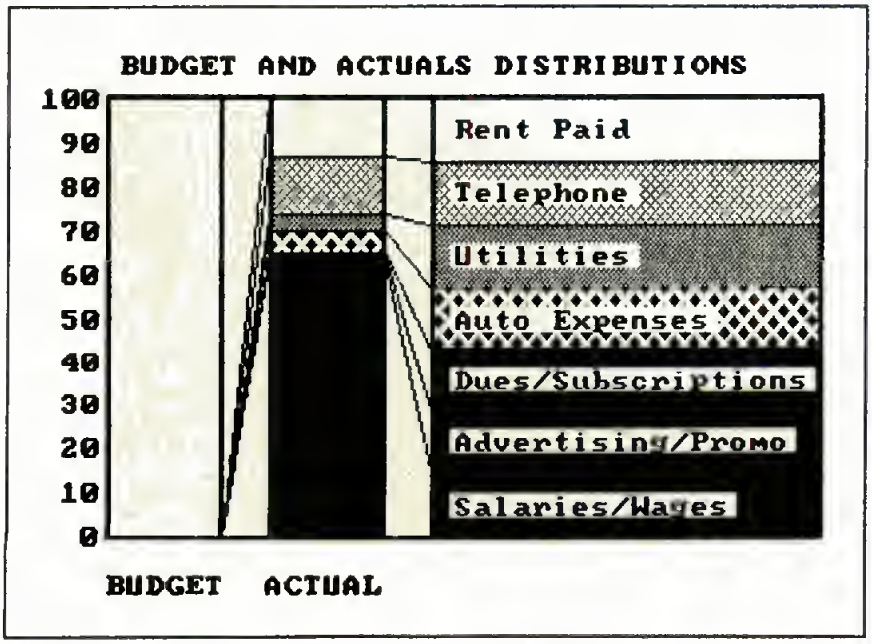


Figure 6: *A* Dollars and Sense *distribution graph showing relative proportions of expenditures and income in seven categories.*

A mini menu at the top of the screen lists the commands for editing, scrolling, inserting and deleting entries, and returning to previous menus. Transactions you already entered also can be changed through the Edit Transactions item on the main menu.

If you use *Dollars and Sense* to reconcile bank statements, you can mark the status of each check or deposit as cleared. If you use it to write checks, you'll need special preprinted computerized check forms. The manual explains how to order them.

Show and Tell

Once you've gotten the technique under your belt and entered some transactions, it's time for the bells and whistles: reports and graphs. The program provides several reports that list transactions, summarize accounts, show cash flow, and compare amounts budgeted with actual expenditures and receipts. You can display them on your monitor or print them out. Graphics are generated from the main menu. The submenu lets you choose between monochrome or color on your monitor and lets you print out a hard copy on a dot matrix printer in addition to the screen display.

The most useful graphs are those that show the relationship between actual and budgeted income and spending. For example, Figure 5 is a bar graph of actual monthly net income compared to projected net income for the free-lance home business, including a trend line. You can produce such graphs for an individual category in your account or for a composite of categories. In addition, you can produce a distribution graph showing the relative proportion of expenditure or income from up to 12 account categories (Figure 6).

If your only purpose is to maintain household accounts, you write relatively few checks, and you aren't floundering in debt with a nagging sense that you're doing something wrong, you probably don't need *Dollars and Sense*. It's more

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WALL STREET

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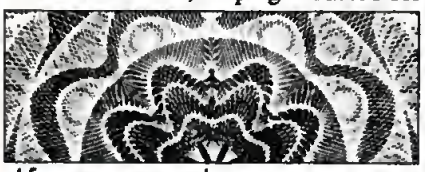
Although *Dollars and $ense* is easy to learn and use, it does have a few eccentricities. Instead of relying on the Return key to enter a selection, the program uses P for



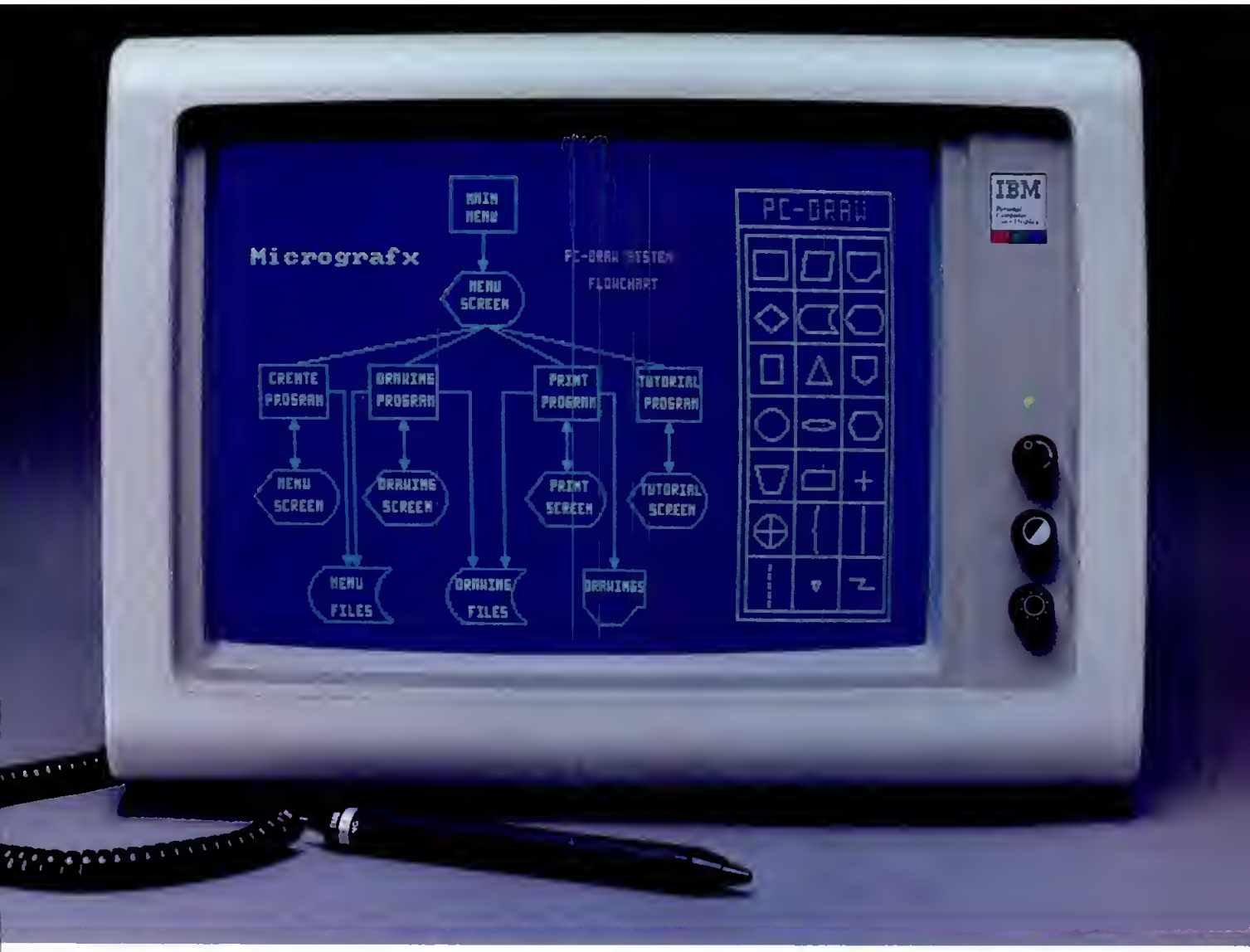
If your only purpose is to maintain household accounts, you don't need Dollars and $ense.

proceed. And instead of using the Esc key to return to a previous menu, it uses Q for quit at the prompt.

The manual comes in a three-ring plastic binder and a cardboard slipcase. Although the documentation is clearly written and amply illustrated, it's not well organized. Too frequently, I found myself thumbing through the index, then turning to three or four scattered pages in search of an explanation. To ease that burden, plan to spend time with the demo/tutorial disk included in the package.

According to the manual, a double-sided data disk will hold up to 4,000 transactions. It would be easier if the program was able to maintain independent records for more than one account on a single disk.

But these are relatively small quibbles for a package that clearly delivers what it promises. You can trust *Dollars and $ense* with your dollars and cents. ■



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CIRCLE 181 ON READER SERVICE CARD

COVER STORY/NICK MAFFEI

The PC Way To FINANCIAL INDEPENDENCE

Everyone has a dream. Mine has always been to make my fortune quickly, retire early, and live off my investments. Until recently, however, all my attempts to do so have met with little success. But once I gave up the notion of instant wealth and discovered the power of the PC as an investment tool, my fortunes began to improve.

At first I imagined that all I had to do was set up my finances on a PC, sit back and watch my assets appreciate. Well, it didn't work out that way, but along the way I learned a few things.

Before I started using an IBM PC, I had only modest financial success. I had a home, a couple of real estate properties, and about $50,000 invested in stocks, mutual funds, and limited partnerships—certainly not enough to expect to retire on. I had to find ways to make my money grow faster.

I was not ignorant about money or computers. I had an M.B.A. degree in finance and several years of sales experience in data processing. Even so, I had to teach myself how to use the PC to better manage my several investments. The learning process was slow and involved a good deal of trial and error.

Playing with VisiCalc

The first IBM PC I used for this task was one I borrowed from work during Christmas 1982. I had an adequate manual system for tracking my investments, but somehow I seemed to spend more time tracking my money than analyzing investment alternatives. I spent the entire holiday season playing with *VisiCalc* and creating financial spreadsheets, budgets and miscellaneous lists. I had a marvelous time!

In January when the time came to take the PC back, I missed it so much I ordered my own. In February I joined the local PC user group and started to attend monthly meetings. While I was familiar with computers, I knew little about the PC and even less about BASIC programming. At first, these meetings seemed much too technical for me, and frankly, I was overwhelmed. Nonetheless, I realized the power of the PC and jumped right in. My initial system consisted of 64K memory, two 320K disk

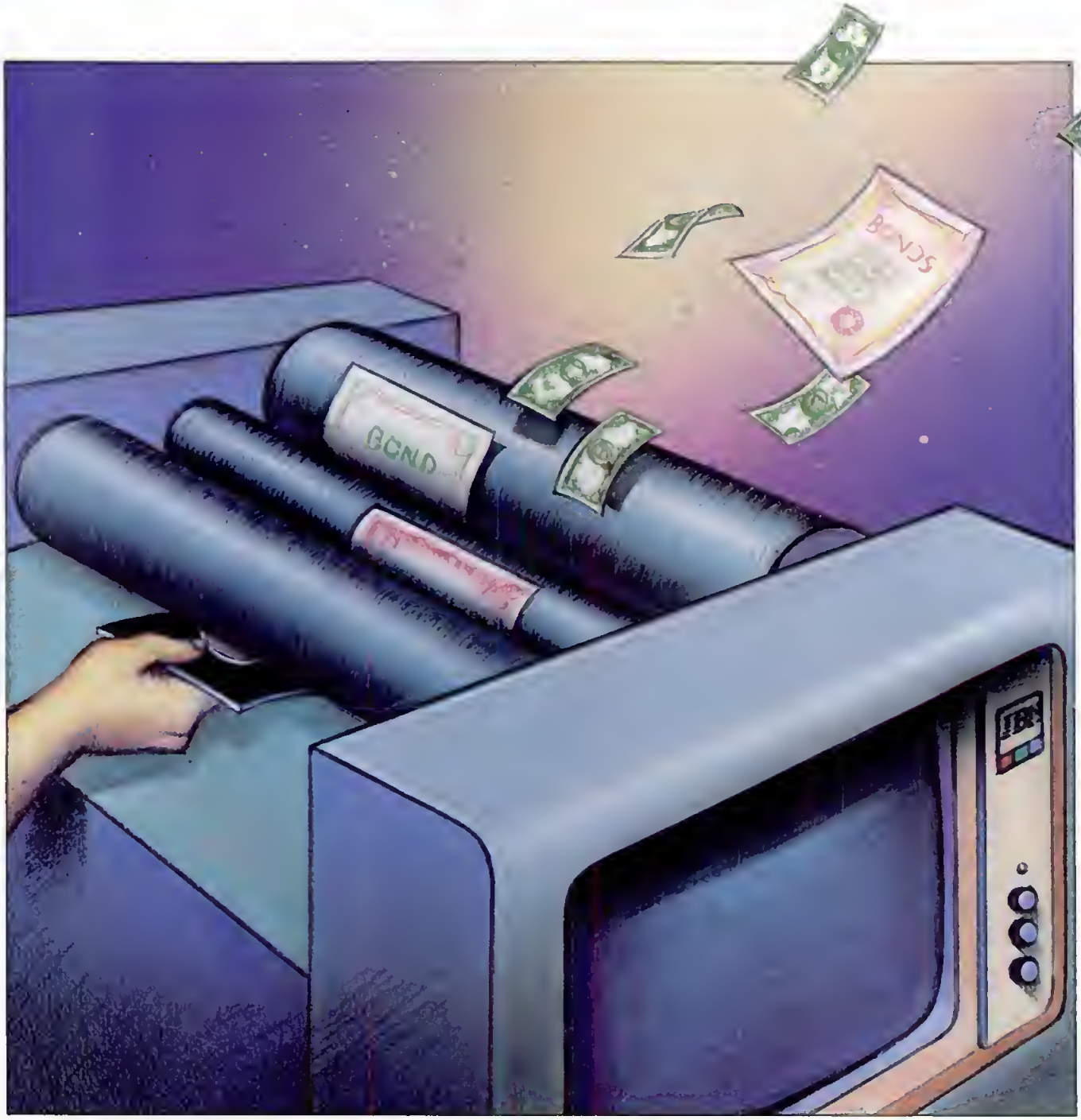

Illustration: Akio Matsuyoshi

An investor uses a PC to write programs to analyze his investment alternatives. He doesn't make a fortune overnight, but he learns a few things along the way.

drives, a monochrome display, and a graphics printer. The price (purchased through my company) was $3,082. I immediately upgraded it to 256K memory and purchased Lotus' *1-2-3*. Within a month's time I had entered my entire portfolio on my PC. The first *1-2-3* program I wrote dramatically illustrates the principle of starting to invest as early as possible (see the *1-2-3* worksheet in Figure 1).

I discovered that the PC has some great advantages for the weekend investor. If you are interested in using the PC to keep track of your investments, as a first step I suggest that you design your own financial reports using a program like *1-2-3* rather than trying to program in BASIC or another language. This way, setting up and maintaining your reports will be a great deal easier. I recommend that you keep them simple and limit them to one page.

I believe that a few standard financial reports are absolutely essential for any investor. These are easy to create and include a financial statement, a history and projection of net worth, an annual cash flow, and a history and projection of taxes.

My personal financial statement is actually composed of three separate schedules located side-by-side within one spreadsheet (rather than running vertically down the spreadsheet). I chose this format because I wanted different column widths for each schedule. Some spreadsheets do allow for varying column widths, but the width then applies throughout the entire schedule.

The first page of my financial statement summarizes all the details from my supplementary schedules. It shows assets and liabilities, annual sources of income, and net worth. I usually update and print a new statement twice a year. My first supplementary schedule lists banking information which includes bank name, address, account number, and balance. This is followed by a detailed list of stocks and securities which shows description, date acquired, owner, and current market value. Next is a list of IRA accounts followed by the same information. I separate these two because I want to know which investments are IRAs and which can be converted into cash for new investments.

The second supplementary schedule lists real estate owned and limited partnerships. Listed under this are the location, date acquired, mortgage amount, fair market value, and current equity. Here again, these properties are separately summarized on the first page so that I can identify which are part of a syndication and which

AGE	INDIVIDUAL A	INDIVIDUAL B	FORMULA A	FORMULA B
22	2,240	0	2000*1.12	0
23	4,509	0	2000+B4*1.12	0
24	7,050	0	2000+B5*1.12	0
25	9,896	0	2000+B6*1.12	0
26	13,083	0	2000+B7*1.12	0
27	16,653	0	2000+B8*1.12	0
28	18,652	2,240	+B9*1.12	2000*1.12
29	20,890	4,509	+B10*1.12	2000+C10*1.12
30	23,397	7,050	+B11*1.12	2000+C11*1.12
31	26,204	9,896	+B12*1.12	2000+C12*1.12
32	29,349	13,083	+B13*1.12	2000+C13*1.12
33	32,871	16,653	+B14*1.12	2000+C14*1.12
34	36,815	20,652	+B15*1.12	2000+C15*1.12
35	41,233	25,130	+B16*1.12	2000+C16*1.12
36	46,181	30,146	+B17*1.12	2000+C17*1.12
37	51,723	35,763	+B18*1.12	2000+C18*1.12
38	57,929	42,055	+B19*1.12	2000+C19*1.12
39	64,881	49,101	+B20*1.12	2000+C20*1.12
40	72,667	56,993	+B21*1.12	2000+C21*1.12
41	81,387	65,832	+B22*1.12	2000+C22*1.12
42	91,153	75,732	+B23*1.12	2000+C23*1.12
43	102,092	86,820	+B24*1.12	2000+C24*1.12
44	114,343	99,239	+B25*1.12	2000+C25*1.12
45	128,064	113,147	+B26*1.12	2000+C26*1.12
46	143,431	128,725	+B27*1.12	2000+C27*1.12
47	160,643	146,172	+B28*1.12	2000+C28*1.12
48	179,920	165,713	+B29*1.12	2000+C29*1.12
49	201,511	187,598	+B30*1.12	2000+C30*1.12
50	225,692	212,110	+B31*1.12	2000+C31*1.12
51	252,775	239,563	+B32*1.12	2000+C32*1.12
52	283,108	270,311	+B33*1.12	2000+C33*1.12
53	317,081	304,748	+B34*1.12	2000+C34*1.12
54	355,130	343,318	+B35*1.12	2000+C35*1.12
55	397,746	386,516	+B36*1.12	2000+C36*1.12
56	445,476	434,898	+B37*1.12	2000+C37*1.12
57	498,933	489,085	+B38*1.12	2000+C38*1.12
58	558,805	549,776	+B39*1.12	2000+C39*1.12
59	625,861	617,749	+B40*1.12	2000+C40*1.12
60	700,965	693,879	+B41*1.12	2000+C41*1.12
61	785,080	779,144	+B42*1.12	2000+C42*1.12
62	879,290	874,641	+B43*1.12	2000+C43*1.12
63	984,805	981,598	+B44*1.12	2000+C44*1.12
64	1,102,981	1,101,390	+B45*1.12	2000+C45*1.12
65	1,235,339	1,235,557	+B46*1.12	2000+C46*1.12

Figure 1: *Two individuals, each 22, have an extra $2,000 a year to spend or invest as they choose. One opens an IRA account which averages 12 percent per year return and for 6 years puts in $2,000 per year. He then stops contributing to his IRA and for the next 37 years, spends the $2,000 a year on himself. The other individual does just the opposite. He spends his $2,000 a year on himself for 6 years and then, for the next 37 years, invests $2,000 a year in his IRA, which earns 12 percent per year. At age 65, both IRA's are worth the same amount! This example was written up in a financial newsletter and I adapted it to 1-2-3. This figure is the worksheet.*

are available for trade or sale. I also list life insurance policies and financial credit information.

The format of your financial statement may be different from mine—that is the beauty of designing your own. You need not be limited to a standardized preprinted form; you can customize it to match your own needs.

I also suggest creating a one-page summary of your actual net worth for the past 5 years. This report should show one line for each major category of asset and liability. A companion program should project your net worth for the next 5 years. This report should be based on your assumptions of a percent growth and a risk factor associated with each asset. This is an extremely valuable report and I update it constantly. I also check to see that each investment is on target and that my portfolio is balanced between conservative and aggressive investments.

I also created a one-page annual cash flow report, which has about ten categories of income (for example, salary, bonuses, reimbursed expenses, loans, interest, dividends, federal and state tax refunds). The expense categories should include such items as food, clothing, utilities, mortgage, vacations, and investments.

I sort this cash flow report in descending sequence with the highest expenses at the top and then combine it with the previous year's report so that I can quickly spot whether an expenditure is decreasing or increasing. For the past few years I have concentrated on reducing my income tax expense and have now relegated it to the bottom third of my list. At the same time, I have significantly increased the funds available for investments. The PC has helped me focus my attention on my investments.

If you believe that tax knowledge is the best investment you can make, then a 5-year report of your taxes is absolutely essential. My tax report is basically a summary of my federal tax return. It shows the various categories of gross income, adjustments to gross, itemized deductions, taxable income, net tax, and refund. It also calculates my tax bracket and marginal rate for each year.

Writing Your Own Program

Most of your financial reports can be created with a spreadsheet like the one included in *1-2-3*. But even this has its limits. Tracking a family budget, for example, can be rather awkward, because

The format of your financial statement may be different from mine—that is the beauty of designing your own.

entering your monthly expenses into a spreadsheet requires constantly moving the cursor to the various expense categories.

This task would be relatively simple in BASIC; you could use INPUT and WRITE commands to enter the data, but a problem occurs when you find out that most examples in programming BASIC use DATA and READ statements, or they use Sequential files that can not be easily updated. (You have to use EDLIN under DOS.) What the family budget needs is a RANDOM file, which can be updated by BASIC. But the disadvantage is that all updates, adds, changes and deletes must be made by a BASIC program. This tedious and time-consuming task is called file maintenance. Is there an easier way? Fortunately, the answer is yes.

If I had to do it over again, I'd create my personal budget file with a program like *PC-File*. (To obtain a current version of this program, send $25 to Jim Button, P.O. Box 5786, Bellevue, WA 98006). This program will take care of all file maintenance functions like creating, updating, and sorting. If you want a special report, you can access the data file using BASIC and display it as you wish. In other words, I would write a simple list program, which is relatively easy to do in BASIC.

Property Management

The first complete application I wrote in BASIC was a property management program. It took about a month, working weekends and occasional evenings. Many off-the-shelf property management packages are available, but I wanted to write my own. I prefer to write several small programs rather than one large one. My program consists of five programs; MENU. PM1, PM2, PM3, PM4. I also write the main menu screen as a separate program, which allows me to select and chain to any of the other programs in the application. This way I can add additional reports to the menu as I think of them.

My MENU program allows me to select the property and the year that I want to update or display. PM1 creates and maintains the property record and gives such information as description, cost, year acquired, and so forth. PM2 is a simple program that allows me to update income and expenses, and PM3 displays the current and all preceding years' income and expenses for each individual property. PM4 is a consolidated report that shows all income and expenses for every property for any one year. This program is particularly handy at tax time. At year's end, I print out a detail report for each property along with the consolidated report and give them to my tax accountant.

I keep these reports current throughout the year, so that I can monitor my expenses and see how I'm doing year-to-

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The safe dry cleaning system

Falcon Safety Products, Inc. 1065 Bristol Road Mountainside NJ 07092

CIRCLE 169 ON READER SERVICE CARD

date. I also tie all the figures back to my personal financial reports—a task that was difficult before I had a computer.

Making Your Money Grow

Whether you regard the PC as help or hinderance, it works for me. Over the past year I have watched my investments grow by more than 50 percent. This growth occurred during one of the strongest bull markets in the history of the American Stock Exchange, but I don't think I could

I can monitor my expenses and see how I'm doing year-to-date. I also tie all the figures back to my personal financial reports.

have attained the results I did without a computer. The IBM PC helped me analyze, manage, and account for my investment portfolio. I don't offer the PC as the end-all solution to your financial investments. Buying a PC will not make you rich, but it may enable you to improve your portfolio and take some of the tedium out of managing your investments.

You may be lucky or smart enough to find some get-rich-quick scheme to make your fortune. But, in the meantime, using a PC is a good way to hedge your bets on your way to financial independence. ■

Nick Maffei has been with IBM in sales for the last 20 years.

PROJECT: DATA BASE

Part 3

In this third part of PC's six-part database series, we present the final installment of our survey of Rolodex-style programs.

This segment of Project: Database is the final set of reviews of Category 1 databases—the simple file managers or Rolodex-type packages.

Somehow, in this part we've ended up with four databases that proudly announce their file management purpose in their names. *EasyFiler* is easy to use but hard to learn, while *FASTFILE*'s report generation is indeed fast. *PFS:FILE* can file your data just fine, but it relies on its coworker, *PFS:REPORT*, to format the data for you. *RANK AND FILE I* attains its quick operating speed by ranking up to 64K of data records in memory and filing information to the screen or printer just about as fast as you can request it.

The other databases reviewed here are as varied in their personalities as in their names. *VersaText* sorts rather than indexes flat files. *Data Design* offers an easy-to-use method for designing record formats, whereas *NUTSHELL* features effective screen-painting tools.

Advanced DB Master runs under the UCSD Pascal operating system; when you use *Query!*[2], you invoke each component program individually from DOS. Read the review of *SUPER* to see if it lives up to its name, and don't be wary of *BEAST*, which is a quite well-mannered creature.

In the next issue, we'll look at our second category: relational databases. ■

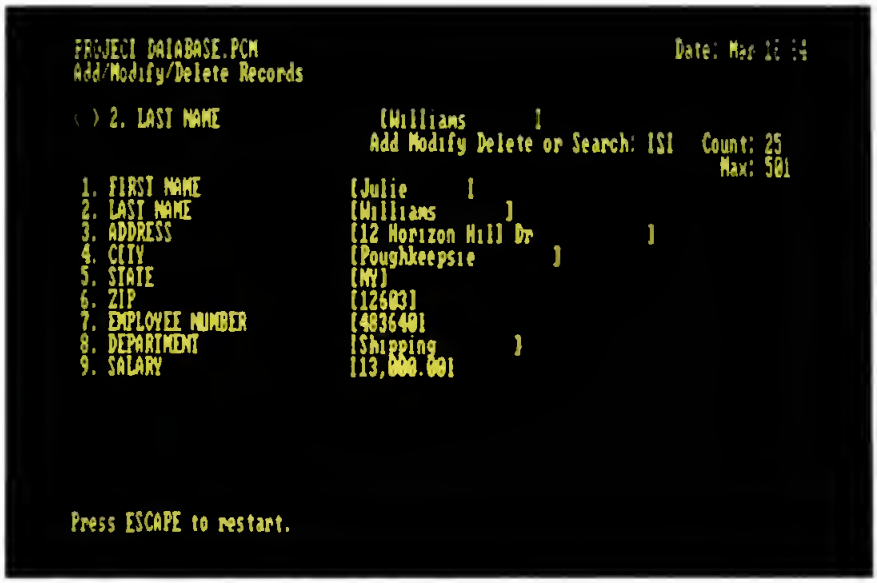
Photograph: Dennis Chalken

EasyFiler: Easier Said Than Done

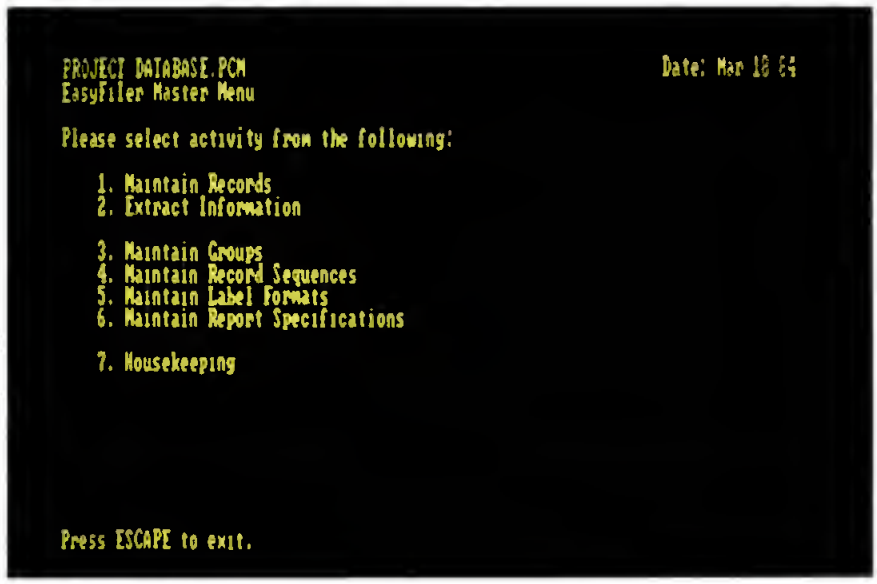
Contrary to its name, *EasyFiler* (Version 3.2) by IUS Software is not extremely easy to learn and operate. However, once learned it is powerful and, within its limitations, quite flexible.

To begin with, the program includes no help screens or table lookups. This is only an inconvenience in most cases, but when you first boot *EasyFiler* the program asks you to enter a three-letter code linked to the file name as the data selector. Since the program only supplies the last code used, entry is impossible if you cannot remember the proper letters. The code and the file extension are one and the same, but many users will not know how to use the DOS directory.

Potential users may find *EasyFiler* unattractive for another reason: A printer is mandatory for many of the program's functions. For example, a table listing the file specifications can be accessed only by using a printout or by exiting to the main menu, entering the Housekeeping disk menu, and viewing the Datafile Profile option. Perhaps more critically, the Add BASIC Batch feature, used for importing ASCII files, requires a connected printer. If the program is being used at a location where a printer is unavailable, this inconvenience becomes a problem. If you mistakenly ask for a printout when no printer is connected, the program locks up without supplying a device time-out error message and recovery is possible only by rebooting the system.



An employee record in *EasyFiler*'s format.



***EasyFiler*'s Master menu.**

EasyFiler is unfriendly in other areas, too. It doesn't allow reaccess to the Extract disk except through the main menu on the system disk. And if the Esc key is pressed while in the first menu, reentry is possible only by exiting to DOS.

In spite of all these inconveniences, *EasyFiler* does shine as a database management system. Creating a data file requires entering the file specifications in three video forms, into which all data is later entered. The first form requests the data file name, creation date, lines per printed page, and the number of disk drives the file will be stored on. This last feature is not yet available; IUS will

EasyFiler
Information Unlimited Software
2401 Marinship Way
Sausalito, CA 94965
(415) 331-6700
List Price: $400
Description: Flat file.
Requires: 64K RAM, 2 disk drives, DOS 1.1 or 2.0, printer for importing.
Records per File: Limited by disk space.

CIRCLE 709 ON READER SERVICE CARD

Illustrations: Phil Anderson

inform all registered owners when it is. In the second form, you input all field specifications including a list of possible values, whether it is a calculated field, and which of three keys—key, unique key, soundex key (Soundalike)—applies, if any. The third form allocates space on the disk.

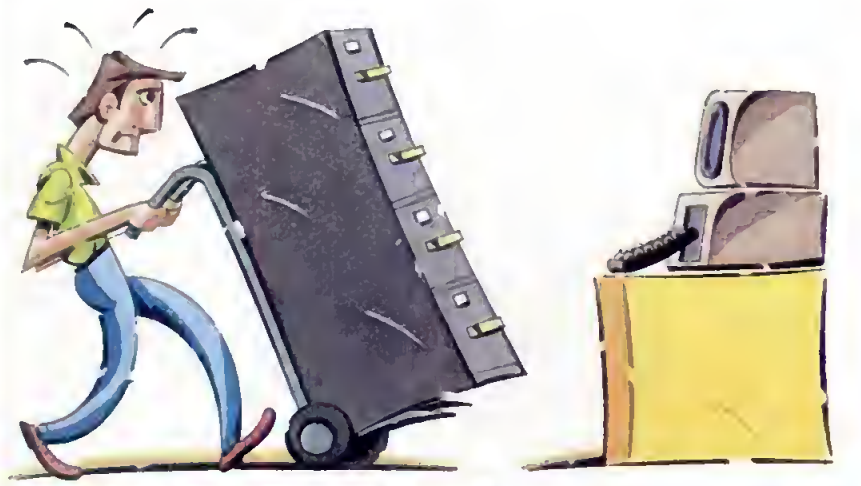
Record Maintenance

Record maintenance, accessed through the main menu, permits you to add, modify, delete, or search for the record and the importing of BASIC batch records. When you enter the video form, the cursor is resting in diagonal brackets. By manipulating the up and down arrows, you can change the key field displayed to the right. Once you have entered the desired key field, the cursor jumps to the next set of brackets, which list the type of action being taken, such as Add. Below this area are the field names and the input area. You save the record by entering it. Although you may leave some fields blank, at least one key field must be entered with data. Also listed on the screen is the number of records in the file and the maximum number available.

Searching for a record is simply a matter of choosing the key field you want and typing in the relevant data. For example, if the record you are searching is Doug Williams and the key field you're using is Last Name–Soundex Key, you can type in Williams or Wiliams and the first appropriate occurrence will appear. By hitting the Return key you can view the other occurrences.

Data Organization

In addition to the key fields, data can be organized and manipulated through the use of groups. This feature enables you to define certain records as subsets of the original data file. Creating a group involves entering the field number, the group name, and the criteria used for selecting the group members. The operands available include *greater than, less than, equal to, not equal to, contains, matches,* and *is between.* You can create complex groups by including or excluding other groups. These groups can then be sorted with up to five fields by using the Maintain Record Sequence menu.



Searching for a record is simply a matter of choosing the key field you want and typing in the relevant data.

Report generation involves defining three areas: general information, titles, and columns. Within the general information area you specify the report name, page width and length, pitch size, and lines per inch. Also defined are the number of lines in headings, top of page and bottom of page, the dollar and date formats, the level of detail, and the method of separating control breaks and grand totals. Defining titles essentially consists of deciding whether text should precede the report or be printed at the top and bottom of the page.

The Define Report Columns form is perhaps the most difficult *EasyFiler* form for a novice to use. It is not overly complicated, but it is difficult to visualize how the report will look once it is printed. You have to visualize the report as a listing of the current line, the print position, and the number of print positions left. The term *column* is confusing: It refers to the physical number of items on the line to be printed. Thus the fifth column in the report is not being printed on the fifth column of the paper or screen; it is the fifth group of items being printed on the line. Among the information you must be supplied with is which fields the column will contain, masks and headings if any, spaces and lines to be skipped, and whether data should be suppressed if it is being duplicated. Besides custom reports, the program also prints labels.

EasyFiler also permits you to insert data into an *EasyWriter* document, perform simple calculations on fields, and restructure the data file by creating a new profile and merging the old data into the new file. Another feature lets you create letters into which data from the file can be inserted.

EasyFiler may not be easy to learn and may be difficult to use without a printer, but it is a good file management system. It would be worth the $400 price tag if the program was revised to allow for an optional printer and an automatic listing of data files available. **—Vincent Puglia**

PROJECT DATA BASE

FASTFILE: Putting COBOL to Work

```
01KDiMeara
02XStefano
03X410 Market St
04XShreveport
05XLA
06X71101
07X194067
08XData Processing
09S      25800.00
01KBanning
02XDavid
03X100 Catherine Ave
04XCincinnati
05XOH
06X45215
07X593830
08XMarketing
09S      53500.00
```

Employee records in *FASTFILE*'s import/export file structure.

FASTFILE is one of the few applications I've seen at this level that uses COBOL—in particular, RM COBOL. That language has definite strengths, not least of which is its inherent ability to index. As a field-oriented language, it is ideal for data applications. *FASTFILE* puts both of these features to good use, though it still has a rough edge or two.

Creating a database with *FASTFILE* is an exercise in good procedures inadequately applied. You start by entering the name you want to use for the database. Unfortunately, *FASTFILE* is aimed at the single-drive user as its lowest denominator: No obvious provision has been made for specifying a destination drive. You are allowed eight characters for the database name. By virtue of the nature of strings, if you can relinquish two of the eight characters you can slip in a drive name (A:, B:, or C:).

FASTFILE
Datamate Co.
4135 S. 100th E. Ave. #128
Tulsa, OK 74146
(918) 664-7276
List Price: $395
Description: Flat file.
Requires: 128K RAM, 1 disk drive, DOS 1.1 or 2.x.
Records per File: Limited by disk space.

CIRCLE 710 ON READER SERVICE CARD

Data Dictionary

FASTFILE maintains an abbreviated data dictionary of the fields you create and tracks them by number. Numbers are automatically provided by the program, but fortunately you can override them. It's a good thing that this is possible. The initial field number supplied, 0, is an invalid number for *FASTFILE*'s purposes. You can change it to 1, but *FASTFILE* does not increment from this new number; rather, it adds it to its starting point of 0. One result of this faulty field numbering scheme is that where a correct default value would need only a carriage return, you now have to go back and enter the correct number of that default value's field.

When you create a database, entering the field data is a simple proposition, although you do have to struggle through a prompt that has no apparent logical basis. Before you can enter anything, you're asked to press a key to see the next screen of data—it might have been helpful to see some data first. Each item has between 9 and 12 definitions associated with it. Aside from the field name and length (a 40-character maximum for all but the key field, which is limited to 20), full-screen positioning information is allowed as well as the specifications for a required field and default value. When entering numeric data, range and validity checks are also allowed.

You can produce very attractive screen forms with one minor exception: FASTFILE includes the field number when it displays the prompts you create.

You can produce very attractive screen forms with one minor exception: *FASTFILE* includes the field number when it displays the prompts you create. This is unnecessary because COBOL is a field-oriented language. It moves between fields as most authoring languages allow you to move from character to character. Moving from field to field should be as simple as pressing the down arrow or Return key.

Creating a database with FASTFILE is an exercise in good procedures inadequately applied.

Razzle-Dazzle Reports

EnQuiry, the reporting module, is where *FASTFILE* flies. It uses a procedural language to generate paper copies. You can sort on several fields, create temporary fields to house the results of calculations, add fixed amounts to any field, and recall information on any of several field criteria. Sorting, for instance, can be accomplished simply by telling EnQuiry to Sort by Department by Salary. It is one of the best report generators I have seen.

FASTFILE's second best feature is its documentation, a superb reference volume. The author takes pains to describe the components of a database and the procedures needed to make comprehensive use of *FASTFILE*. It runs you through several scenarios that create a fictitious (or real, if you like) data file in preparation for your own.

EnQuiry makes *FASTFILE* worth its high price. Some intelligent refinements should bring this program up to its full potential. **—Bill O'Brien**

VersaText: Quick and Dirty

VersaText is a slow and unsophisticated but easy to use program that allows you to create and manipulate simple flat files. It combines word processing and database functions in a single, $125 package. While I did not review the word processing functions in detail, they appear to be reasonably comprehensive. The database functions are not.

Once you have backed up all the distribution diskettes (a process that does not exactly follow the description given in the manual, but is close enough), you have a bootable *VersaText* disk. When you run it, it presents you with a main menu laid out in a 3-by-3 grid mimicking the layout of the PC's numeric keypad and offering standard word processing functions as well as an item labeled Database.

Choosing Option 9 for Database brings up another, similarly shaped menu of database functions: creating files; entering, altering, and deleting records; viewing and printing records; and sorting. Using *VersaText* is simply a matter of making a menu selection and following the reasonably clear instructions on the screen.

VersaText
TexaSoft, Inc.
3415 Westminister #100
Dallas, TX 75205
(214) 369-0795
List Price: $125
Description: Flat file.
Requires: 128K RAM, 2 disk drives.
Records per File: 1,200 for sorting, otherwise limited by disk space.

CIRCLE 711 ON READER SERVICE CARD

Wasted Disk Space

Creating a database means giving field names, lengths, and types. The only types available are numeric and character. Field length is up to you, but the sum of all field lengths must not exceed 255 characters. When the definition process is finished, your diskette will contain two files. One holds the definition; the other, empty, is ready to receive data.

When you choose Data Entry from the database menu, you're presented with a data entry screen that displays field names and a space long enough to enter data up to the field limit you defined earlier. No tail-

VersaText's employee record input screen.

oring of the screen is possible; you can't, for example, make the input screen mimic the paper form from which you're copying the data.

All data is stored in fixed-length, 256-character records, a gross waste of disk space if your data records are much shorter than 256 characters. On a 320K diskette, you can never fit more than about 1200 records, even if they're each only 20 or 30 characters long. This fixed-length arrangement makes it easy to locate an arbitrary record: *VersaText* can move instantly to record number 325.

The space waste might be forgivable if *VersaText* used this quick-access possibility to offer sophisticated indexing and location of records, but *VersaText* does not index at all. If you don't know the number of the record you want, the program has to search for it sequentially from the beginning of the database. If you ask to view all the records for people living in Peoria, *VersaText* hunts for them the way you'd hunt through a box of index cards: It starts at the beginning, and stops whenever it sees Peoria. Even if you've taken the trouble to sort the file in order of city, it still starts hunting at the beginning. On a 500-record test database, *VersaText* took about a minute to find a record just past the halfway point and a minute and 44 seconds to reach a record in position 493.

Slow Search

Searching is limited to one field at a time. Say you want to produce a list of Peoria residents with incomes over $20,000. *VersaText* can help you with Peoria or income but not both at once. It will extract all the Peoria people and put them in a separate file, from which you can extract all those with the required incomes. You can specify several values for the extraction field (Peoria or Pittsburgh, for example), or a range of values (income greater than $20,000). A request that produced 100 records from the 500-record test database took about 5 minutes.

You're more limited if you simply want to view the records on the screen, since selection can be only on a single value of the field or on the presence of a character string in the field. If you can look for the records with a "P" in the city field, you'll get not only Peoria and Pittsburgh but Philadelphia and Portland as well. The database allows you to look through these records for the incomes greater than $20,000, but *VersaText* can't do it for you—range searching isn't provided for when you're viewing the records.

After most of the sorting time has passed, VersaText announces that it might not have enough space—do you perhaps have another blank, formatted diskette lying about?

Deletion procedures are even less sophisticated. You specify record numbers, and *VersaText* then grinds through the entire database, recopying it without those records. With a 500-record database, deleting a single record takes nearly 3 minutes, but deleting 25 records takes only a minute longer. According to the manual, you have to specify the records to be deleted in sequential order. In practice, however, a couple of minor variations from the correct order didn't seem to matter at all.

Eternal Sort

Because it maintains no indexes, the database must be sorted in whatever order you want your reports to appear. *VersaText* sorts a database onto itself; it doesn't keep the original file as a backup. And the manual doesn't even suggest making a copy of the original file before sorting. You should, because sorting a database of any size takes forever, and a power failure or similar mishap is quite conceivable.

The sort time increases roughly according to the square of the number of records. The manual states that a maximum of 1,200 records can be sorted, which would take over 2 hours. The manual warns you that you might be asked to load a blank, formatted working disk during the sorting process. Here's what actually happens: After most of the sorting time has passed (about 20 minutes in the 500-record case), *VersaText* announces that it might not have enough space—do you perhaps have another blank, formatted diskette lying about? If you answer No, it asks whether you want to continue. After 20 minutes? It's not at all clear how it determines that it might not have the space, nor why it doesn't figure that out until so late in the process. If you do give it the diskette it wants, it leaves what appears to be a completely sorted extra copy of the file behind on the extra diskette.

Addition and deletion of records are fairly easy to accomplish; most other modifications to the database are either awk-

ward or impossible. You can add fields to records (as long as the total length doesn't exceed 255 characters), but you can't change the size of a field, nor can you remove a field, not even by building a new database and copying data into it. To change a database structure, you can use a word processing program or EDLIN to modify the structure file directly. To add a field, you add a field name, length, and type description. To put data into the new field, you have to edit the entire database.

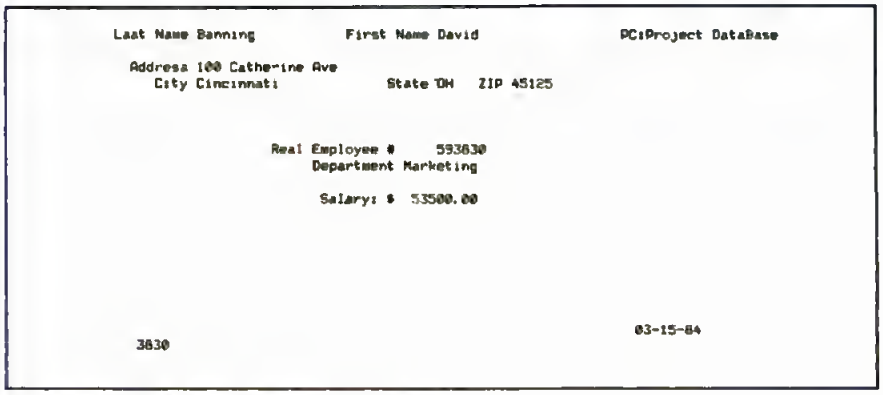
Use of a word processor is also necessary to create the specification file for printed output or on-screen reports. Report layout is fairly flexible: Reports can include totals or averages for any numeric field or counts of how often a particular field contains a value or is empty. You can't count occurrences of *Peoria,* though, nor can you do any calculations on the data. You can't subtotal, and the program doesn't know that paper comes in pages; it prints in a continuous stream, ignoring page ends. You can tell it to start the report with a particular record number, but otherwise all selection of records must be done as a separate step.

VersaText consists of seven different programs, some in BASIC and some in compiled BASIC (.EXE files). It also includes a number of .BAT files; menu selections frequently lead you through detours via the operating system to load the appropriate programs. Usually this works; occasionally, a detour dead-ends, leaving you with the A> prompt. This is a minor problem for an experienced user and perhaps a more significant one for the newcomer. The programs themselves did not reveal any bugs. Pressing Ctrl-Break when in the BASIC parts of the system causes a return to BASIC, and there's no other apparent way to abort execution.

Why should you consider *VersaText*? Well, it is inexpensive, and it might be adequate for small mailing lists or similar databases. And there may be people who will find its word processor is terrific.

—John Helliwell

Advanced DB Master: Too Much Power?



An *Advanced DB Master* employee record.

One moment please . . . One moment please . . . One moment please . . . No, we haven't gone back in time to play you a tape of 1950s telephone operators. That's just the message that will begin burning its way into your PC's screen phosphors when you start using *Advanced DB Master (ADBM).*

ADBM is an upgrade of an Apple II product *(DB Master)* with enhanced capabilities for the PC. To maintain program portability, its developers opted to implement the program using IBM's version of UCSD Pascal, and *ADBM* spends a good deal of time figuring out what to do as a result. With 640K RAM, just starting the system from a warm boot takes over a minute, *ADBM* takes over 20 seconds to open a file and anywhere from 20 seconds up to switch between system functions. According to its developers, it's even slower using the 256K RAM minimum they recommend.

Advanced DB Master
Stoneware, Inc.
50 Belvedere St.
San Raphael, CA 94901
(415) 454-6500
List Price: $595
Description: Flat file
Requires: 512K RAM, 1 disk drive.
Records per File: 5,000 to 15,000 depending on record size and disk space.

CIRCLE 712 ON READER SERVICE CARD

The decision not to implement the product in PC-DOS possibly cripples an otherwise strong entry into the Rolodex-style data management field. *ADBM*'s problem is not only that it's slow to respond but also that data transportability is not currently possible unless your operating system is the USCD p-System. Data porting to PC-DOS and to and from Apple computers is planned for a future release, but dates are uncertain. If you expect to use imported or exported data with your file manager, or if you merely want the convenience of not having to reboot your PC to use it, look for another product. And be careful even then—like *ADBM,* many programs don't reveal their operating system until after you've plucked down your cash.

More Than Enough

Operating system aside, *ADBM* is a strong program for a single-file user. It is capable of performing more flexible data structuring, data entry and modification editing, indexing, sorting, and reporting than most of its competitors. Its report generator has the sort of flexibility more often associated with an advanced programming language than with a file manager.

If anything, *ADBM* is *too* strong—you

Input Screen Specifications

Method	Capabilities				
	No. screens per file	No. files per screen	Simulats paper forms	Link help messages/ prompts to a field	Master/detail relationships
Input screen is designed by user. All other entry is done on "video forms."	1	1	Yes	Prompts are used instead of error messages	Data can be defined and manipulated as a group, as in a mini-database.
Automatic/ programmed	32	1	Yes	No	No
Automatic	1	1	No	No	No
"Painted." Easy to specify, hard to change	1	1	Yes	Yes	No
"Painted"	2 million (subject to disk space).	1	Yes	Not customized, but help screens are linked to operations within screens	No
"Painted"	1	1	Yes, on input only.	Virtually nonexistent	Yes, for calculations, posting.
"Painted"	1	1	No	No	No
Automatic	1	1	No	No	No
"Painted"	20	1	Yes	No	No
"Painted"	26	1	Yes	No	No
"Painted"	1 (but 1 form can consist of up to 5 screens)	1	Yes	No	No

1. Follow instructions on the other side

Inverted Back

Back

1. Follow instructions on the other side

Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
    1. Front side touching the free page
    2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet

Folded edge of the page

GbsSlipSheet-001

Inverted Foldout slip-sheet

Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
    1. Front side touching the free page
    2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet

PROJECT DATA BASE

Name	Data Model	Marketing Features		
		Length of Time on Market	Number of Sales	Price
EasyFiler I.U.S. 2401 Marinship Way Sausalito, CA 94965 (415) 331-6700	Indexed file	Since 1980	At least 2,500	$400
FASTFILE Datamate Co. 4135 S. 100th E. Ave., #128 Tulsa, OK 74146 (800) 262-7276	Indexed file	Since April 1984	—	$395
VersaText TexaSoft, Inc. 4925 Greenville Ave. #660 Dallas, TX 75206 (214) 369-0795	Indexed file	Since 1981	Roughly 6,000	$199.95
Advanced DB Master Stoneware Inc. 50 Belvedere St. San Raphael, CA 94901 (415) 454-6500	Indexed file	Since October 1983	Confidential	$595
NUTSHELL Leading Edge Products, Inc. 55 Providence Hwy. Norwood, MA 02062 (800) 343-3436	Flat file	Since April 1984	—	$395
SUPER I.S.A. 36 E. Baltimore Pike Media, PA 19063 (215) 566-0801	Indexed file	Since October 1980	At least 1,000	$199
PFS:FILE **PFS:REPORT** Software Publishing Corp. 1901 Landings Dr. Mountain View, CA 94043 (415) 962-8910	Indexed file	*PFS FILE* since 1980; *PFS REPORT* since 1981	*PFS FILE* 300,000; *PFS REPORT* 130,000	*PFS FILE*, $140, *PFS REPORT*, $125
Query!² Hoyle & Hoyle Software, Inc. 716 S. Elam Ave. Greensboro, NC 27403 (919) 378-1050	Flat file	Since 1982	7,852	$99.95
BEAST DATA MANAGER Stanton Software P.O. Box 173 Stanton, NJ 08885 (201) 236-6842	Indexed file	Since July 1983	Less than 100	$65
DATA DESIGN Insoft P.O. Box 608 Beaverton, OR 97075 (503) 641-5241	Indexed file, record management system	Since mid 1983	Confidential	Not available
RANK AND FILE I RAF Software, Inc. P.O. Box 32338 San Antonio, TX 78216 (512) 366-1057	Flat file	Since January 1984	Confidential	$160

EDITOR'S NOTE: Dash (—) indicates "Not Applicable"

Record Count: 16

Field	Mean	Std. Dev.	Total	Minimum	Maximum
Salary: $	35706.250	11123.481	571300.00	20900.00	53500.00
Real Employee #	425581.3	168184.6	6809301	194067	694030

***Advanced DB Master* is able to supply statistics on selected fields.**

have to wonder why all this power has been applied to such a simple data management approach—and it certainly isn't for PC beginners. Its documentation attests to that the tutorial supplied by Stoneware (the system reference manual is not yet available) requires 102 pages just to take you from starting the system to entering the first record. At that point you are encouraged to give yourself a healthy pat on the back—which you will deserve.

Once data is entered and *Advanced DB Master* is showing its stuff, accessing and editing a record is quick and easy (it's moving into and out of any function that takes so long). As a matter of fact, once you get the hang of it, the data design and screen formatting methods used are among the most flexible I've seen, although I ran into some annoyances and a bug or two in data entry mode. You can have range and value tests, and, uniquely, a Yes/No field enabling logical sorting and access of the data in your file. You can even specify up to ten fields as members of the file's index, which can (but won't always) overcome *ADBM*'s insistence that index values be unique.

Handy Features

Other handy features include date and time stamps that are automatically entered into a record when it is entered or modified. These can help a data administrator monitor the entry and update of data into a file's records. Also handy are automatic entry number fields and calculated fields that can be specified with enough flexibility to satisfy almost any requirement.

ADBM's report generator is as flexible as you could possibly want but not nearly as simple as using the data management functions. The menu offerings are at best obscure. But the outputs, including complete and understandable report format descriptions on your screen or printer, are handy and helpful when debugging a report. Formatting includes excellent field placement facilities, headers, footers, pagination, and a full array of field formats including COBOL-like pictures. It's hard to use, but you'll like the results.

If you expect to use imported or exported data with your file manager or you merely want the convenience of not having to reboot your PC to use it, look for another product.

Crash Landing

However, when I tried to print the same sorted report I'd created with every other system tested, *ADBM* fell apart. It not only crashed, it took my data file with it, and even after Stoneware sent a newer version of the system, that system crashed whenever time I tried to use this file—in a different place each time.

Stoneware representatives were mostly concerned that I hadn't yet signed a license agreement and only sent an updated copy after much badgering. At that point they suggested that I start again and rebuild the data file, though they've since relented and asked for a copy of it to examine.

Part of the problem with the crashes was that, like most PC users, I'm familiar with PC-DOS but not with the UCSD p-System that *ADBM* uses. Without sufficient chunks of the operating system to work with (Stoneware sends you just enough to boot your PC and run the product), I could not even examine the file. Only after many attempts at using *ADBM* with the file I managed to get one brief look at the garbage in an errant record before *ADBM* crashed again.

Stoneware should have been more helpful when the only message on *ADBM*'s screen was: Please Shift-Print Screen And Send Output To Stoneware. At that point I couldn't comply with the request.—**John Dickinson**

(Text continues following the Database Charts.)

Entry Editing Capabilities					
None	Range Tests	Specific Values	Default Values	Table Lookup (to an Outside File)	Verify (Requires Data To Be Input Twice)
—	Yes	Yes	Yes	No	Yes
—	Yes	Yes	Yes	No	No
—	No	No	No	No	No
—	Yes	Yes	Yes	Yes	No
None	—	—	—	—	—
—	Yes	No	—	No	No
None	—	—	—	—	—
None	—	—	—	—	—
—	No	No	No	No	No
—	No	No	No	No	No
None	No	No	No	No	No

Entry Editing Capabilities (cont'd)			Adaptation to PC		
Required Field	Date Tests/Date Conversion	Other	ASCII Characters Only	Graphics Symbols	Color
Only if defined as one of tha key fields.	Yes	No	Yes	No	Yes
Yes	No	No	Yes	Double underline only	No
No	No	Prevents alpha characters in numeric fields.	No	Yes	No
Yes	Yes, including autodate/ time (handy for forcing input/change date stamp)	No	Yes	No	No
—	—	—	Yes	Only in title sequence, which is animated .	Not required, but configurable.
No	Yes	No	Yes	No	No
—	—	—	Yes	No	No
—	—	—	Yes	No	No
Index must be entered and must be unique.	No	Prevents alpha characters in numeric fields.	No	Yes	No
No	No	—	Yes	No	Color adapter
—	—	Can specify fields such as phone numbers and social secunty numbers.	No	Draws boxes.	Yes

DOS 2.x Subdirectories	Alternate Input Methods (mouse, etc.)	Files Across Multiple Drives	Function Keys	User Interface	Files: Method of Data dictionary or other means
No	No	No	No	Forms/prompting	No
No	No	No	Minimal	Visual	Yes, data dictionary.
Accesses files in a subdirectory under certain conditions	No	No	Not used in database module; limited use in word processing module	Menus/prompting	A data description file, specifying field name, length, and type.
No	No	Yes	No	Visual screen creation environment is strongest aspect	Yes, data dictionary.
Yes	No	No	Yes, used well.	Prompting, but may be bypassed	Yes, data dictionary.
No	No	Yes	No	Prompting	No
No	No	No	No	Visual	1 file with data and variable-length header
Yes	No	No	Allows use of PrtSc key	Menus	No
No	No	No, but control and index information are put on A drive with data on B drive	Yes, can be user-defined for the menus	Visual/prompting	Data specification done in create program for fixed-length fields
No	No	Yes	Yes	Uses menu and provides good feedback and extensive highlighting	No
Yes	No	No	Yes	Menu/screen form	No

Files (cont'd)

Specification	Things You Can Specify				
Must files be built/modified only from data dictionary?	None	Field data	Tokens, aliases, or synonyms	Index data	Permissions/security
—	—	Yes	No	Keys can be defined at any time.	No
Yes	—	Yes	Yes	Yes	No
No	—	Name, length, and type.	No	No	No
Yes, but some modifications cannot be made.	—	Yes	Yes	Yes, must be unique, but can have subindexes.	Yes
Yes, first create dictionary, then paint screen(s), then start data entry.	—	Name, length, and type.	No	Yes, all fields are indexed.	No
—	None	—	—	—	—
No	None	—	—	—	—
—	None	—	—	—	—
Not after file has been defined.	—	Length and type	No	Yes, must be unique.	No
—	None	—	—	—	—
—	None	—	—	—	—

Encryption	Relations	Validity tests	Error or prompting messages	Multiple views of database	System: Maximum No. Record Types per Database
No	Data can be related by group.	No	No	Only via use of groups	1
No	No	Yes	No	No	1
No	No	Prevents alpha characters in numeric field.	No	No	1
No	Yes	Yes	No	No	1
No	No	No	No	Yes	1
—	—	—	—	—	1
—	—	—	—	—	1
—	—	—	—	—	1
No	No	Can check for alpha or numeric characters	Menus can be programmed to "prompt"	No	1
—	—	—	—	—	1
—	—	—	—	—	PC-DOS 1.1: one per disk; PC-DOS 2.1: one per subdirectory

Specifications					Error Handling
Maximum No. Fields per Record	Maximum Record Size	Maximum No. Records per File	Maximum No. Records per Database	Maximum Field Size	
50	1,000 bytes	Limited by disk space.	—	255 bytes	Field-by-field, total, and selective reprompting.
50	2,000 bytes	Limited by disk space.	—	40 bytes	Total reprompting
22	255 bytes, invariable for all files.	1,200 for sorting; otherwise limited by disk space	—	Limited by record size.	Field-by-field and total reprompting.
250	3,000 bytes	15,000	—	250 bytes	Field-by-field
60,000	Limited by disk space.	Limited by disk space.	—	16 million bytes	Total reprompting
40	255 bytes	32,767	130,000	255 bytes	Field-by-field, total, and selective reprompting
3,100	Limited by disk space.	Limited by disk space.	2,000	Unlimited	No
255	4,095 bytes	65,535	—	255 bytes	Field-by-field
50	4,000 bytes	90 to 4,000, depending on record size and disk space.	—	8 bytes	Field-by-field; beeps when alpha characters entered in numeric field.
40	2 screens, approximately 3,100 bytes.	Limited by disk space.	—	79 bytes for text fields, 16 bytes for numeric fields.	Field-by-field
250	6,840 bytes	65,535	65,535	76 bytes	Field-by-field and selective reprompting.

Data Types and Maximum Sizes

Character	Numeric				Date
	Integer	Floating point	Money or dollars	Other numeric	
255	2 types: number up to 4 digits, and extended number up to 10 digits.	No	Yes	No	Yes, MM/DD/YY.
40	11 digits	13 digits	No	No	Yes
Limited by record size.	9 digits	No	No	No	No
250	±32,767	16 digits	16 digits	No	Yes, including autodate.
16 million	±16 million, 14 digits.	No	No	No	Yes
255	14 types of numeric fields.	39 digits	Yes	Yes, such as telephone number or percent.	Yes
200; all data treated as character.	No	No	No	No	Yes, YY/MM/DD.
255	No	No	No	No	No
80	±32,767	16 digits	16 digits	No	No
79	16 digits	No	No	No	No
76	15 digits, including decimal point and minus sign.	No	Yes	No	Yes

Types/Sizes (cont'd)		Demo Version			Data Importing
Time	Logical	Available?	Cost	Limitations	
No	No	For dealers only	$50	None	ASCII, requires printer.
No	No	Yes	—	Noninteractive	No
No	No	No	—	—	No
Yes, including auto-time.	No	Yes	Free at retailers, or $9.99 from manufacturer; price can be credited against purchase.	Only 20 records per file	In future release
No	No	Yes	Comes with package	Noninteractive	Special *NUTSHELL* ASCII format
No	No	Yes	$25	Only 15 entries allowed.	No
Yes, HH:MM.	No	No	—	—	No
No	No	No	—	—	No
No	No	Yes	$5	Limit on number of records.	No
No	No	Yes	Free	—	DIF, SDF, and comma-separated format converts *dBASE II* files. Importing is tedious.
No	No	No	—	—	No

Data Exporting	Advanced Features				
	Back-up-ability/ Copy Protection	Audit Trails		Data Restructuring	
		Pre/post imaging	Activity or transaction log	Technique (inherent/ separate program)	Adding or changing indexes
Yes	Neither	No	No	To allow expansion of files, field length can be altered.	Yes
No	Not copy protected	No	No	Inherent	No
SDF with mandatory record deleting	Neither	No	No	Inherent, a field can be added, but no other changes are possible.	—
In future release.	System requires you to back up and tries to enforce usage pattern.	Yes	No	Inherent, may add but not delete fields. Limited field spec changes.	No
Special *NUTSHELL* ASCII format, other ASCII formats	Neither	No	No	Inherent, fields may be added or deleted at any time.	Does not apply; all fields are indexed.
No	Neither	No	No	Inherent, fields can be restructured via posting.	—
No	Copy protected	No	No	Inherent	No
ASCII	Not copy protected	No	No	No	No
ASCII, MailMerge.	Neither	No	No	No	No
DIF, SDF, and comma-separated.	Back-up available	No	No	Inherent	Yes, all fields can be indexed.
ASCII	Copy protected	No	No	Separate program on main menu of package	—

Features (cont'd)		Report Generation			
		Capabilities			
Linked or Multiple Update of Indexes and Files	High-level Language &/or Product Interface	Sorting	Aggregates (min, max, count, avg, percent, etc.)	Arithmetic (*, /, +, −)	Parameter passing
Yes	Interfaces with other Easy-software products.	Up to 5 sort fields	No	Yes	Yes
No	No	Yes	Yes	Yes	No
No	No	Sorts on a single field, ascending order only.	Sum, average count of records with missing/not missing data in a particular field.	No	No
No	No	Yes	Total count, mean standard deviation, minimum, maximum.	Yes	No
No	No	Yes	Totals only	No	No
No	No	Yes	No	Yes	No
No	No	Yes	Yes	Yes	No
No	No	No	No	No	No
No	No	Multiple sort fields; ascending or descending	Totals only	No	No
No	No	No limit	Count, minimum, maximum, average.	Yes, plus exponentiation.	No
No	No	Up to 99 sort fields	Page, grand, and running totals.	Up to 25 calculations per report.	May use parameters to override search and sort criteria and print only summary report.

		Query Language			
Flexibility of output	Multifile access	Mass additions, deletions & updates	Load and unload	Execute stored scripts	Quality of output
Very flexible	No	Yes	No	No	Good
Multiple report scenarios possible	Yes	No	No	Yes	Excellent
Reasonable; no pagination, or subtotaling.	No	No	Yes, record-by-record, from keyboard.	No	Table layout is reasonably flexible, but no pagination or subtotaling.
Excellent; as good as that produced by most programming languages	No	No	No	Yes	Limited only by screen design.
Excellent	No	Mass deletions only.	No	No	Excellent
Headings are difficult.	No	Yes	No	Up to 10 sets of equations can be executed via the selector mode.	Fair
Multiple reports available	No	No	No	No	Good
Printer only	No	No	No	No	Poor
User "paints" screen for report format. Does not allow headers, footers, or dates.	No	No	No	No	You can design your own output form.
Adequate; can select records for printing with <, >, and =.	No	No	No	Not yet	Good report writer
Report includes system date and page number. Paper width and length can be specified.	No	No	No	Selection criteria may be specified for every field if desired.	Good

Report Generation (cont'd)					Procedural Language
Query Language / Other	Report Formatter/ Generator	Screen Dumps	Other	Built-In Applications or Examples	
Grouping of records within selected criteria.	Yes	No	Formats labels, fetches letter documents.	Sample data disk and tutorial	No
No	Yes, an incorporated additional program.	Yes	No	Yes	No
No	Word processing module can create a format specification file.	No	No	A diskette of examples comes with the program.	No
No	No	Yes	No	Yes	No
Quick selection of any value of any field, using index feature.	Same system as data entry screen.	Yes	Prints to disk.	No	No
No	Yes	No	No	No	No
Maximum recall of any or all fields.	Yes	No	No	No	No
Records satisfying search criteria may be viewed on the screen, written to another *Query!*[2] file, or exported to an ASCII file.	Yes, but only prints entire file with or without field names.	Yes	Prints up to 4 mailing labels across page.	No	No
No	Can query only from index; report generator must be used for all other queries.	No	No	No	No
Automatic entry of calculated fields.	Yes; can create headers of up to 6 lines, including date and page number.	Yes	No	Yes, on demo disk.	No
No	Yes	Yes	Prints multiple copies; sends strings of control characters to printer.	No	No

Performance Measurements

Time to Enter Standard info	Time to Execute Standard Task	Time to Perform Sort	Time to Extract Random Records	Size of Database Created	
				Number of records in employee file	Space compression
10 minutes, manually.	21 seconds	35 seconds	2 seconds	25	No
4 hours. Had to write BASIC program to import data.	1 hour	54 seconds	1.2 seconds	25	No
2 hours to manipulate data into *VersaText* format using *dBASE II* and *WordStar*.	1 to 2 minutes to find a single record on a 500 record data base.	26 minutes	1 minute	500	No
2 hours, manually.	Crashed with data loss; unable to perform task.	Crashed with data loss; unable to perform task.	2 seconds	25	Yes
25 minutes, manually.	15 minutes to create screen, but made use of extensive screen-painting facilities.	11 seconds	3 seconds	25	Yes
2 minutes	Immediate display after selecting criteria.	24 seconds	Immediate	25	Yes
20 minutes, manually.	45 minutes, including formatting	13 seconds	1.5 seconds	25	No
40 minutes, manually.	5 seconds	—	5 seconds	25	No
1 hour, manually.	1.75 seconds for retrieve on index; 3.75 to 8.0 seconds when using report generator.	2.5 seconds	1.7 seconds, using index-based query.	25	No
6 hours, 15 minutes, manually.	8 minutes, 28 seconds.	13 minutes, 20 seconds.	4.8 seconds	500	No
40 minutes, manually.	0.5 seconds	9 seconds	Immediate	25	No

Performance Measurements (cont'd)					Hardware/
Database Size Variable length of Fields	Number & Size of Ancillary Files	Degradation with Additional Indexes	Time to Create a Standard Report to Screen	Time to Execute a Standard Report to Screen	Minimum Configuration Required
No	11 files totaling 187,507 bytes.	No	12 minutes	1 to 2 seconds	64K (DOS 1.1), two 320K drives, 132 character printer (mandatory for importing)
No	8 ancillary files totaling 26K	—	1 hour	79 seconds	128K, 1 drive, (DOS 1.1 or 2.x)
No	2 ancillary files: a definition and a data file. Definition file totals 100 lines	—	30 minutes, using word processing module to create a specification file, then using database to debug it.	35 minutes	128K, 2 drives.
No	Not available	—	1 hour	Crashed with data loss; unable to perform task.	512K or more is strongly recommended, 1 drive (2 drives are strongly recommended).
Yes	None	—	4 minutes, 30 seconds.	17 seconds	256K, 1 drive.
Yes	None	No	5 minutes	Immediate	128K, 1 drive.
No	None	—	20 minutes	29 seconds	64K (DOS 1.x), 128K (DOS 2.x), 1 drive.
No	None	—	Unable to create a standard report. Company offers separate report-writer product.	—	128K, 1 drive.
No	3 per file, ranging in length from 384 to 3,328 bytes, plus 1 per report, 1,280 bytes	—	10 minutes	18 seconds	96K, 1 drive.
No	None	Yes	Very easy and fast.	12 minutes, 34 seconds.	128K, 2 drives.
No	2 ancillary files totaling 728 bytes.	—	15 minutes	1 minute (to printer)	128K, 2 drives

Software	Subjective Evaluations				
Configuration Used in Testing	Documentation	Program Robustness	Flexibility/Ease of Use	Would You Buy This One?	Would You Accept It ss a Gift?
256K, DOS 2 0, monochrome monitor, 2 320K drives	If anything, too much.	Excellent, but if the user requests a printout without a printer, the program freezes	Very flexible, but not very easy.	No	Yes
256K, DOS 2 0, 2 drives, 256K Microfazer printer buffer	Good	Good	Fair	No, not in this release.	Yes
320K, 2 drives.	Clear and concise, well organized.	Occasionally stalls in DOS when moving from module to module	Many arbitrary inconsistencies and limitations.	No, because of functional limitations.	No, too limited.
640K, 2 drives.	Overdone tutorial, no reference manual, obscure "quick guide."	Poor	Not easy for a beginner, but it *is* flexible	Definitely not	Definitely not
PC-XT with 256K, DOS 2.0, 1 drive, monochrome adapter and monitor.	No tutorial, extensive index, organized in menu map order	Good, with one exception: accepts alpha data in numeric fields without complaint, but then records it as a zero.	Menu driven, but with option to "jump" to any desired operation	Perhaps	Yes. The program blends a traditional database system with a text-oriented one in a powerful and flexible program
256K, DOS 2.0, 360K, 2 drives, monochrome monitor	Confusing, refers to TRS-80 and CP/M as well as DOS. Page references are wrong.	Poor	Relatively easy, at least at the beginning.	No	No
256K, DOS 2 0, 2 drives, Microfazer printer buffer	Good	Good	Good	Yes	Yes
128K, 2 drives.	Poor	Meager	Fair	No, too simple and inflexible	No
128K, 1 drive.	Incomplete and confusing in places	Didn't crash except when disks not present or null file name entered into report generator.	Easy to use, with very good report generator, but unique index values make it inflexible	No	No
512K, 2 drives: 1 floppy, 1 hard.	Well documented	Good	Easy to use	No, too expensive.	No
128K, 2 drives.	Preliminary documentation is sparse	Good	Good	Yes, for small database.	Yes

NUTSHELL: A Promising Preview

NUTSHELL has not yet been released for sale by its publisher. In fact, had I not been late on meeting my editor's deadline, I would not have seen this version at all.

In spite of its cute name, *NUTSHELL* is a serious tool and an intriguing new type of database management system.

The manual I worked with was not in its final form, and after a short struggle I gave up and tried using the prompts on the screen. I soon discovered that the F1 key always presented me with a screenful of help information, often keyed specifically to the command I was using. The F2 key moved me one level down in the menus, and the Esc key moved me one level back. Menu options are generally spread across the bottom of the screen and may be selected by either typing the first letter or by moving the cursor with the arrow keys.

I quickly found the Define section, where you define the fields you wish to use by entering the field names and then specifying whether each field is a text, numeric, date, calculation, or summary field. There appear to be no facilities for data-entry checking, such as for ranges or must-enter fields.

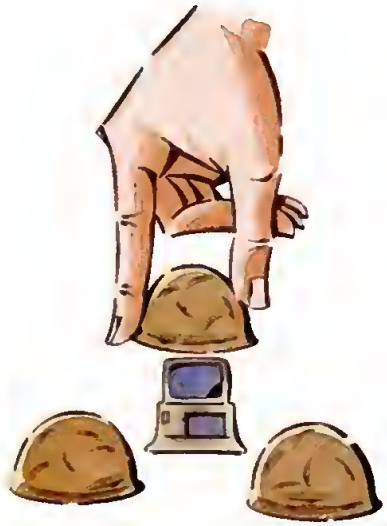
Beautiful Painting

After the fields were defined, I found the Layout section, where *NUTSHELL* had already prepared my data-entry screen. The text fields were each 50 characters long and the numeric field was 15 characters long. *NUTSHELL* has some of the most incredible screen painting facilities I have yet encountered. You can use the RESHAPE command to change any field by selecting it and moving the cursor to the right-hand corner of the spot where you want the field to end. This makes short work of changing the length of a field. Since fields can be longer than one line, you could also use the RESHAPE command to make a few long lines into a long column of shorter lines. Once you have made the field lengths the right size, you can move fields and even whole blocks of fields around the screen. In no time you can have the fields aligned in an attractive and easy-to-fill format.

Going Down Smooth

Data entry is fairly smooth. You must use the Tab key to advance from field to field, and when you are finished you must press either the F10 key or the plus (+) key to accept the record. *NUTSHELL* comes with a nice template that surrounds the entire keyboard to give you a quick reference for these and other active special keys.

The Add Data mode has two draw-



In spite of its cute name, NUTSHELL is a serious tool and an intriguing new type of database management system.

```
F1: Help  F2: Menu                    Browse          25 Records          Pg
Stefano      DiMeara          410 Market St
   Shreveport            LA  71101   194067   Data Processing   25,800.00

 ~ Find  _ Add  _ Modify  _ Delete  _ Sort  _ Print  _ Layout  _ Define
```

***NUTSHELL*'s screen of an employee record.**

NUTSHELL
Leading Edge Products, Inc.
35 Providence Hwy.
Needham, MA 02062
(800) 343-3436
List Price: $395
Description: Flat file
Requires: 256K RAM, 1 disk drive.
Records per File: Limited by disk space.

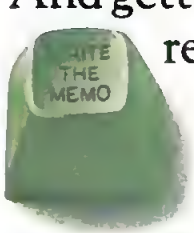
CIRCLE 713 ON READER SERVICE CARD

Before the personal computer, you could file a document, design a form, write a memo and produce a report without reading a single 200-page manual.

You still can.

Yes, it's true. Personal computing has finally gotten us back to where we started. Doing simple things simply. Without having to relearn a single skill. Or read another manual.

Which means that filing a letter is, once again, as easy as filing a letter. And getting forms, memos and reports is just as simple.



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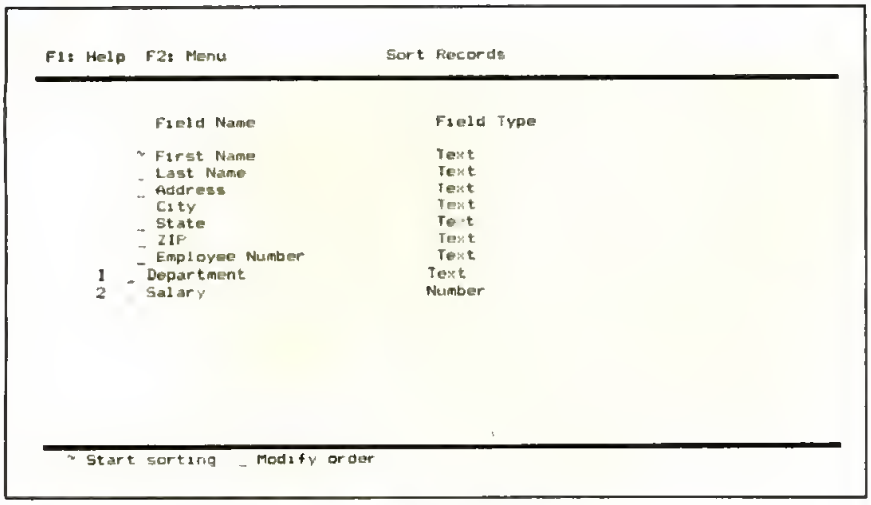
If you need to file a document, **Offix** tells you how. With pop-up menus, help screens and plain English sentences. No manuals. Just step-by-step help. **Offix** does the same for word processing, forms design and report generation. All easy. And all for just $149. See **Offix** at your local retailer. Or call us at 800/782-4896. So you can stop reading. And start doing.

Offix™. The Personal Office System.

EMERGING TECHNOLOGY
2031 Broadway
Boulder, Colorado 80302
(303) 447-9495

*Requirements: MS-DOS, 192K RAM, two disk drives (minimum 320K each). Runs on IBM PC and IBM XT (and most compatible machines), TI PC, NEC APC, DEC Rainbow, Zenith Z-100, Victor 9000, Tandy 2000 and the HP-150

CIRCLE 237 ON READER SERVICE CARD



Sort fields are specified next to field names in *NUTSHELL*.

backs. First, *NUTSHELL* is silent; there are no beeps at all. If you have finished adding a record and forget to hit the F10 key before typing the next record, an error prompt appears on the screen. This is fine if you are looking at the screen, but it doesn't help if you are concentrating on your source document. The other problem is that *NUTSHELL* will accept alphabetic data in a numeric field. There is no warning message at all; your record is stored normally, but when you call the record back you will find that the field has been filled with a zero.

Buffers at Work

When you are adding records, there is also a noticeable delay between the time you press F10 and the time that the next blank screen is presented. After some experimentation I discovered that there is a type-ahead buffer at work, so you may go ahead and start the next record right away, which saves a significant amount of data-entry time.

When you request a record using the FIND facilities, you may use the traditional logical comparisons and specify ranges. One of the most fascinating features of this program is its indexing capability which is extremely useful when searching for records. As difficult as it may be to believe, all fields are index fields in *NUTSHELL*. The file stays in the data entry order, but you can put the cursor in any field and ask to see the index. *NUTSHELL* then displays in order all the values in that field for the entire database. You may scroll down through them or type a letter and jump to the first item that starts with that letter. You may then select a key value and have that entered directly on your search criteria screen.

Find, Sort, and Search

Once you have defined your selection criteria, you may tell *NUTSHELL* to find those records. The resulting subset of your database may be sorted, reported, deleted, or otherwise manipulated as if those records were a database by themselves. Since you may also define numerous different data entry screens and report formats for your database, you can create a database with every possible field included and then create sets of screens and reports to work with different sets of data.

Sorting is equally powerful and easy to use. You simply select the fields you want—all, if you wish. If you don't specify a sort order, *NUTSHELL* will either use the order you specified last in the current work session or will prompt you for a new order if this is the first sort performed since the machine was turned on.

You may set up huge fields so that records have pages and pages of text. You may search throughout a field for a specific string; this feature lets you use *NUTSHELL* for text databases as well as more typical short records.

It is risky to review a product before it is released, because you can never be certain that the product that hits the shelves will be exactly the same as the one you reviewed. Based on the evaluation copy, this product does a good job of delivering what it promises. Parts of it, such as the report formatting, appear a bit complex at first glance, but that is acceptable in a program as flexible as *NUTSHELL*. It is priced higher than some other programs that work with one file at a time, yet it has some capabilities that few others offer. It requires a lot of memory and uses up disk space rather quickly, so it seems best suited for use with a hard disk and DOS 2.0 although it will run on floppy disks under DOS 1.1 if you prefer. This is a promising product, and I would like to spend more time exploring it.

—Alfred Poor

It is always risky to review a product before it is released, because you can never be certain that the product that hits the shelves will be exactly the same as the one you reviewed.

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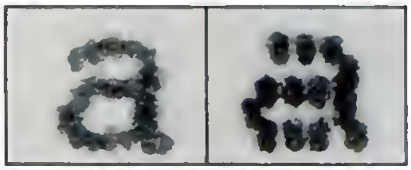
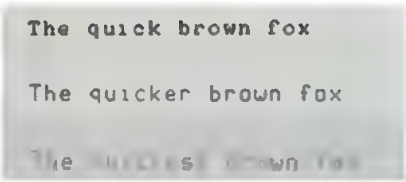
More dots, more fonts, more versatility.

One thing that makes Pinwriters stand out from other



Our exclusive 18-pin print head is graphically sharper than a 9-pin printer, as this unretouched photo shows.

dot matrix printers is our printhead. It has 18 pins. Compared to the usual nine. It also has true dual-pass printing. The result: an amazing 240x240 dots per inch.



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Boxborough, MA
01719

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CIRCLE 170 ON READER SERVICE CARD

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Diablo Printers

CIRCLE 157 ON READER SERVICE CARD

PROJECT DATA BASE

SUPER Database Management System: Least Likely to Succeed

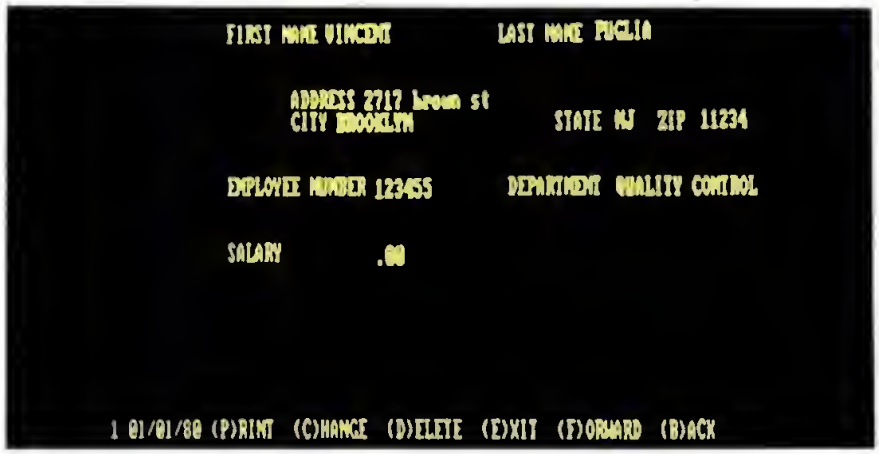
If the current glut of databases on store shelves leads to a shakeout, *SUPER Database Management System* is my choice for the program most likely to fall by the wayside. While there is much of value in the program, there are too many bugs, too little on-screen help, and too little consideration for the novice user.

To begin with, my diskette was labeled "PC-XT." When I called the manufacturer to ask for a standard PC version, I was advised that XT meant 128K. When I mentioned to the company's representative that the manual was filled with TRS-80 references, he explained that I had an old manual and promised to send an updated IBM version immediately.

None of this would matter if the program ran properly, but it doesn't. Some screens fly by too fast to be read. One in particular, the screen that reports the failure of a search, can be crucial because it supplies information about the records surrounding the selected record. Second, there are virtually no help screens. While someone familiar with the system may not need assistance, novice users do. Third, at least one-tenth of the time I spent with the program was relegated to recovering from crashes, dealing with untrapped errors, and re-entering data.

SUPER Database Management System
Institute for
Scientific Analysis
P.O. Box 7186
Wilmington, DE 19803
(215) 566-0801
List Price: $199
Description: Flat file.
Requires: 128K RAM, 2 disk drives, DOS 2.0.
Records per File: 32,767.

CIRCLE 714 ON READER SERVICE CARD



An employee record as seen in *SUPER*.

Difficult Editing

Setting up a database requires supplying the filename and field specifications. There are 21 data types, including one for calculated fields and nine for customized numeric fields. As each field appears on the screen, you fill in the name, type, and length. After all the fields are completed, the program permits editing. Because the editing is selected by field number, you must answer "Yes" to the prompt as many times as there are errors in different fields. To further complicate matters, the screen scrolls upward. If you have many fields and errors, you may be forced to remember which fields you corrected and which you didn't.

As with many other programs, the input display is "painted" on the screen. The fields can be laid out with or without headers (field names). You then manipulate the cursor around the screen to the desired position. Unlike most programs with painted screens, however, *SUPER* does not provide a ruler or a listing of the column and row. As a result, designing an input screen requires much editing to position the fields so they won't overlap and to create an attractive screen.

Although the input program has a "production" option that allows you to copy fields from one record to the next, system crashes caused by illegal function calls are common. Also, since there are no required fields and because the program runs so quickly, empty records or fields are also the norm.

Once the database is filled, you can view or update it in the Display Or Correct Data menu. Three methods for retrieval are provided: by record number, by selection, and by binary search. Searching by

record number requires knowing at the least the general area of the number so that you can scan for it with the back and forward keys. The binary search doesn't work if the database isn't sorted on the field being searched. The selectors available for searching are selection by comparison to another field, selection by substring, selection by range, and selection by code. In all cases, retrieval is almost instantaneous. The only bug is the flying Failure Report screen.

Tricky Utilities

The Manipulate Data Base menu accesses a number of utilities. Included in the menu are arithmetic, sorting, posting, mass updating, purging, and auto deleting operations. The arithmetic operations allow you to perform calculations on fields and enter the results into the same or different fields. Although the program checks for obvious mathematical taboos, such as dividing with zero, it does not stop null operations from being carried out. During one such operation, the system crashed. It crashed once more while I was entering data for the sort. However, *SUPER*'s sort is fairly fast; it sorts 25 records in 6 seconds or less.

Report forms are difficult to create if nonfilename headings are to be incorporated, because there is no text input in the design option. Therefore, you must configure a separate database file so that the header appears where it should. Because the manual does not give a visual example, the actual process is vague.

The manual is vague, in part because it is a generic manual for a translated program. Naturally, no use is made of the function keys or any other PC-specific capabilities. In addition, the manual is poorly edited. Incorrect page references are made, and the explanations are overwritten with few concrete examples.

The *SUPER Database Management System* needs at least one more revision—although the Institute for Scientific Analysis might be better off scrapping it and starting anew.—**Vincent Puglia**

PFS: FILE and PFS: REPORT: Electronic File Cards

The PFS package is the type of database manager that you remember with fondness, the way you remember index cards once you've moved on to neatly bound data books with handy address and telephone sections.

PFS has absolutely no frills, basically because it has absolutely no features. It has no default field values, no derived fields (in FILE), no range checking, no way to even specify if data should be alphabetic or numeric.

It does have remarkable input screen formatting—you can insert a field name anywhere you want. Simply end it with a colon so the program knows what it is. And the program doesn't care how many you have, either: you can put 100 fields on a screen. If you have 101, start a second screen—the program has 31, which you can fill for a database up to 4 megabytes in size (if you exceed that number you will get an error message).

Have you forgotten to add a notes or reminder field and don't want to go through the trouble of restructuring the file? As long as you haven't exceeded the page limit, you have access to an "I forgot!" page with a single, nondescript fieldname. It is very much like adding more index cards when and if you need them.

The package has some problems, however. Although you can redesign the form after you've entered data, you must match up the field names exactly, otherwise the information field and the data it contained in the original file, will be omitted from the restructured file.

PFS:FILE and PFS:REPORT
Software Publishing Corp.
1901 Landings Dr.
Mountain View, CA 94943
(415) 962-8910
List Price: $265
Description: Flat file.
Requires: 64K RAM and DOS 1.x or 128K RAM and DOS 2.x, 1 disk drive.
Records per File: Limited by disk space.

CIRCLE 715 ON READER SERVICE CARD

If you want to make sure the information is entered in any particular format, you're out of luck. All data entry is free form.

Free-form Entry

Also, if you want to make sure the information is entered in any particular format, you're out of luck. With the exception of dates and times, which can be entered using the PC's function keys for current values, all data entry is free form—just like an index card. This method is excellent if you're storing text passages for phrase recall, but not so good if

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THE SOFTWARE LINK, INC.

6700 23-B Roswell Rd., Atlanta, GA 30328 Telex. 4996147 SWLINK

CALL: 404/255-1254

Dealer Inquiries Invited

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Terminals courtesy of CLINE Computers

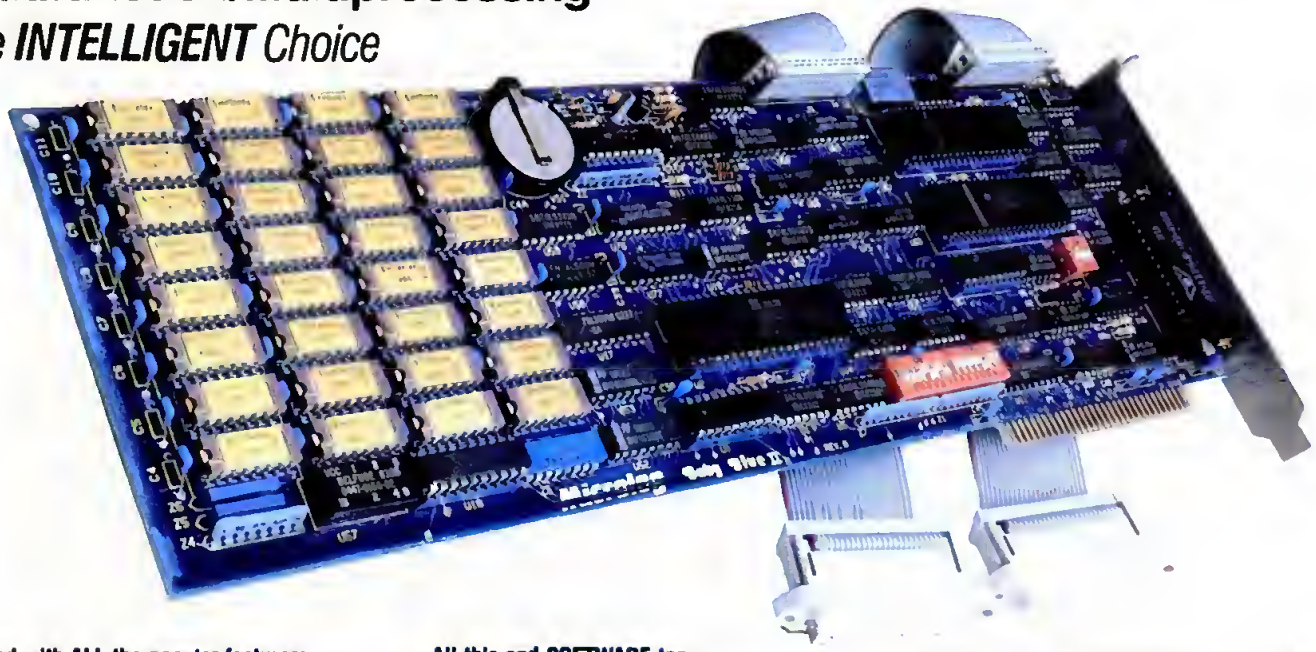
IBM ... trademarks of IBM ... dBASE II, Lotus ... 5000 are ... MicroPro, ... Corp., & ... respectively.

CIRCLE 393 ON READER SERVICE CARD

Baby Blue II

Multifunction/Multiprocessing

*The **INTELLIGENT** Choice*



Packed with ALL the popular features:

- Up to a **256 Kilobyte Memory Expansion**, optional in 64K blocks.
- **Clock/Calendar** with long-life battery back-up (choose replaceable or optional rechargeable battery).
- **Parallel Port** for use with IBM/Epson and most other parallel printers (addressable as LPT1: or LPT2:)
- **Two (2) Serial Ports** addressable as COM1: and COM2:, OR use our unique extended port addressing to configure for serial devices other than COM1: and COM2: (i.e. pointing devices, graphics tablets, etc.)
- **Baby Blue II** is fully compatible with the IBM PC, the PC/XT and other compatibles, including the Texas Instruments Professional Computer.

Not just another DUMB multi-function board.

With all that hardware to manage, we think a board should have a brain. You won't find this feature on other boards – they may look pretty, but they can be pretty boring once you get them home. Baby Blue II is actually a second computer inside your PC, built around the high-speed Z-80B microprocessor.

- **Background Processing:**
  Compile, assemble, sort, calculate, communicate or print – all in the background, while you and your PC continue to work on other tasks in the foreground. Because it is a separate computer, Baby Blue II performs these functions without slowing down your PC, helping you to do more work in less time.
- **Autostart at Preset Time:**
  Baby Blue II can begin any task, even a background operation, at a specific time by consulting the on-board real-time clock.
- **CP/M Capability:**
  Baby Blue II offers instant access to the vast CP/M-80 library of mature, professional software for every conceivable application.
- **Dual Portad Mamory and I/O:**
  You can use Baby Blue II's memory, ports and clock as ordinary enhancements to your PC. Or, you can let our Z-80 micro-processor control the board directly, for truly independent back-ground operation.

All this and SOFTWARE too . . .

Systems utilities

PDQ RAMdisk Software: create a FAST pseudo-disk drive of any size in available system RAM. The DOS 2.0 version lets you change the size of your RAMdisk from the keyboard.

Print Buffer/Spooler: a TRUE print spooler: the Z-80 buffers and manages printing independent of your PC. Unlike other so-called "spoolers", this one won't stop your printer or slow you down when you start another job.

Clock Software: sets Baby Blue II's clock and initializes the system clock at boot time – never type the time and date again!

Commenications

Smart Terminal Emulator Package (STEP): talk to other microcomputers or connect to larger host computers, as an asynchronous terminal through Baby Blue II's serial ports. Unlike other "smart terminal" programs, STEP offers full emulation of popular video display terminals (tha standard package includes Televideo 950 and Hazeltine 1500.
IBM 3101, DEC VT100 and many others are optionally available). You can send or receive text files, and with STEP's unique Sessions Menu, changing your configuration is a keystroke away.

BSTAM File Transfer Utility: Transmit and Receive text, HEX, and binary files (including .COM files) without errors and without fuss. BSTAM is easy to use, with all configuration parameters handled transparentiy under STEP.

CP/M-80 compatibility

Baby Blue Conversion Software: Microlog's famous CP/M Emulator turns CP/M-80 programs into PC-DOS programs for fast, efficient execution on Baby Blue II. Completely transparent operation using standard PC-DOS commands – freely mix PC-DOS with CP/M programs and text/data files on the same PC-DOS disks.

Convert: supports bidirectional tile transfer between PC-DOS and popular CP/M disk formats.

Keyfix: automates your keyboard with 54 programmable function keys for CP/M programs, eliminating tedious typing chores (max. 80 characters per key).

Baby Blue II (64K installed) . . . . . $ 695.

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CIRCLE 516 ON READER SERVICE CARD

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CP/M is a registered trademark of Digital Research, Inc.
BSTAM is a trademark of Byrom Software, Inc
IBM is a trademark of you know who
©1983 Microlog, Inc.

you want strictly numeric data. And the package cannot import or export files outside of its own environment.

PFS:FILE creates a 16K module as the base data file. This includes all field name and screen count information plus all of the data you've entered. Later, when you add parameters from the *REPORT* program, they are also kept in the base file.

PFS has some odd features. Advancing from one field to the next is done with the Tab or Shift-Tab keys (depending on direction of travel). While this arrangement may not seem terrible, the Escape key, directly above the Tab, cancels the current function—perhaps a poor choice. The Return key will move you down one line, but that's its only function.

On the plus side, not only does *PFS* support the cursor keys, but also the Ins key. Ins comes in very handy when moving field names around to give your input screen a better look. You can retrieve information from any record by specifying a particular field item, a partial item, several items or several partial items. All records with matching information are displayed sequentially. With this arrangement in mind, it should come as no surprise that the larger the database, the longer the search times become.

PFS:REPORT carries out all of the manipulative functions. You can predefine a number of report formats. These include renaming the fields for simpler, or more complex, descriptions on your printed reports. It supports both Boolean and arithmetic operators as well as automatic case transposition during criteria entry.

It will lump consecutive identical data items under one subheading and counts, totals, subtotals and page breaks are also included in its arsenal. Any of the fields placed in column 1 of the report become the key field and the object of its sort. If identical key fields do exist, column 2 information is used for a secondary sort. You can decide whether this sorting is done in ascending or descending order.

PFS has some odd features. Still, not only does it support the cursor keys, but also the Ins key. Ins comes in very handy when moving field names around to give your input screen a better look.

PFS:REPORT is not perfect, however. Its reports are row oriented—you couldn't get a mailing label out of it if you wanted to. That limitation is a decided frailty when you consider the combined price of the *FILE* and *REPORT* modules.

Overall, the *PFS* manuals are excellent. For most data entry schemes and report formats, the first run through will give you all of the information you need to use it over and over again. In fact, it took only about an hour for me to get working using a hands-on plus manual learning approach. Becoming familiar with the Tab key advance feature was the only major stumbling block.

PFS files are in a non-ASCII format, which can be inconvenient if you want to change software but keep your files. As with index cards, once you've started with *PFS*, and amassed a large volume of material, it's much easier to stay with the package. But then, *PFS* has never claimed to be anything more than a set of index cards.—**Bill O'Brien**

PFS Report

Department	Salary	First Name	Last Name
Accounting	15500.00	Alex	Marshall
Data Processing	25800.00	Stefano	DiMeara
	27500.00	Alice	Horton
	29200.00	Rae Ann	Howard
	30500.00	Mitzi	Matuso
	32100.00	Marlena	Evans
	40200.00	Doug	Williams
	45300.00	Herb	Bittner
		Roberta	Condon
Marketing	46900.00	Liz	Chandler
	50300.00	Eugene	Bradford
	51300.00	Joshua	Fallon
	53500.00	David	Banning
Production	13300.00	Danny	Grant
	16700.00	Oliver	Davies
	20900.00	Gwen	Davies
	25100.00	Don	Craig
	25300.00	Don	Kincaid
	25700.00	Neil	Curtis
Shipping	13000.00	Julie	Williams
	13100.00	Chris	Kositchek
	13500.00	Abe	Carver
		George	Bayliss
	14300.00	Maggie	Horton
	14800.00	Anna	Brady

***PFS:FILE*'s data is accessed via *PFS:REPORT*.**

QUERY!²: Nuts and Bolts

Two months ago I would have recommended *Query!²* unequivocally. Priced then at $29.95, it handled files with features found in the top dogs of the database management world. The no-frills package kept over 7,000 users happy.

Today *Query!²* is still a no-frills package delivered in a plain manila envelope. The documentation is being revised and so is the price—it's been increased over 200 percent. At $99.95, the product enters the price range of the popular typeset-documentation, painted-screen personal filing systems. In this league, *Query!²* will be hard-pressed to garner 7,000 more customers.

Not that the program isn't worth the money. On the contrary; for the user who needs a filing system for the lowest possible investment, *Query!²* may be just what the doctor ordered. It offers functionality but it lacks finesse. Most discriminating buyers, however, will probably fork over the extra $60 or $100 for a classier and easier-to-use system.

What does *Query!²* offer besides the opportunity to commandeer a database management system at a budget price? The package covers the essential functions in eight programs that provide file creation, data editing and retrieval, sorting, searching, and printing. These functions are invoked individually from the DOS command line. No one program ties the system together under a main menu.

The programs' operator interface evokes memories of the teletype era of computers—all entries are made in scroll mode without fancy screen painting, positioning with arrow keys, or highlighting of input fields.

```
fname          : David
lname          : Banning
address        : 100 Catherine Ave.
city           : Cincinnati
state          : OH
zip            : 45215
enumber        : 593830
department     : Marketing
salary         :  5350000

COMMAND? + 1


                Record Number 2     (Active)
fname          : George
lname          : Bayliss
address        : 27 Lenbrook Lane
city           : Knoxville
state          : TN
zip            : 37918
enumber        : 103850
department     : Shipping
salary         :  1350000

COMMAND?
```

Employee records appear in this format in *Query!²*.

After inputting a record or form, you can make changes by indicating the number of the field you wish to modify. *Query!²* numbers the fields sequentially. I longed for the straightforward method of cursor positioning after constantly referring to these numbers. The system appears to have been designed for programming ease at the expense of user-friendliness. Prompting for reference numbers doesn't exactly qualify as state-of-the-art software engineering.

Query!² provides a printing capability, but this is not a general-purpose report generator. The complete file may be printed as a sequential list with every field or as mailing labels. Mailing labels can only be generated, however, if the first fields of the file are the name, address, city, state, and zip code. Furthermore, these fields must correspond with preset sizes imposed by the system.

To supplement the modest printing function, Hoyle and Hoyle sells a regular report generator that interfaces with the product for $19.95. That $20 brings the price of *Query!²* that much closer to the more sophisticated and more polished file management systems with integrated report generators.

Pleasant Search

One pleasant surprise nestled in *Query!²* is the search function. You can select records on up to 40 conditions con-

***Query!²* Version 2.02**
Hoyle and Hoyle Software, Inc.
716 S. Elam Ave.
Greensboro, NC 27403
(919) 378-1050
List Price: $100
Description: Flat file.
Requires: 128K RAM, 1 disk drive.
Records per File: 65,535.

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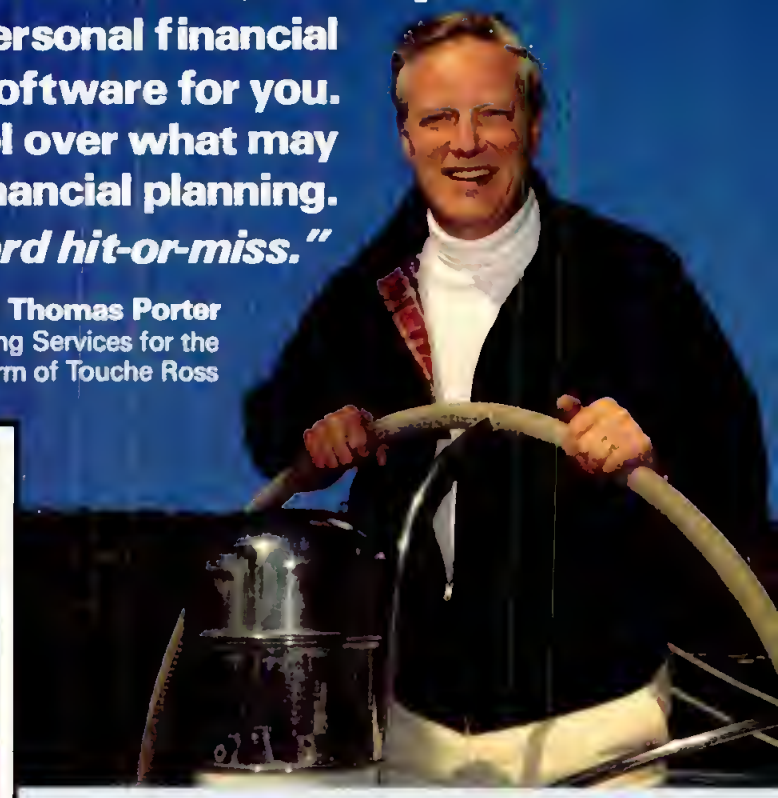
Director of Personal Financial Planning Services for the Big-8 Accounting firm of Touche Ross



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2. **Income and Expenditure Ratios:** Are you within safe limits? Your Planner will tell you.
3. **Investment Analysis and Strategies:** Based on your own financial circumstances.
4. **Tax Planning:** The Planner helps you maximize benefits and minimize tax exposure.
5. **Retirement Planning:** Find out what you should be doing now to make your retirement dreams come true.
6. **Estate Planning:** The most important facet of personal financial planning becomes a breeze.
7. **Education Financing:** You have four children, ages 6, 9, 12, and 15. How much should you be setting aside now for their education?
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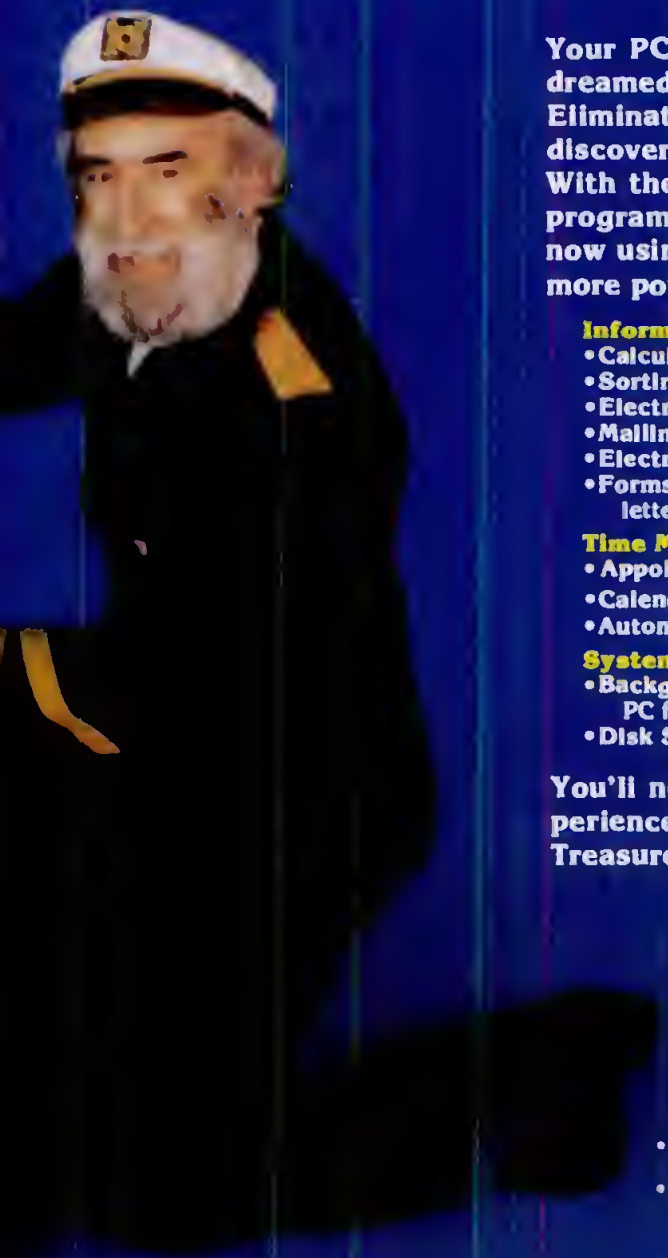

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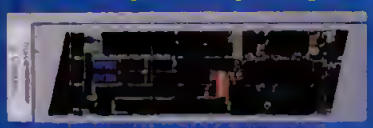

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CIRCLE 501 ON READER SERVICE CARD

sisting of algebraic comparisons (equal, less than, and such) coupled with logical "and/or" criteria. A trivial example would be "Find All The Records Of Marketing Department Employees Who Live In Pennsylvania." *Query!*[2] responds quickly, and it will display the records on the screen, create another database file with them, or export them to an ASCII file—not too shabby, especially for a low-end product.

When considering budget software, I buckle my brow and keep a wary eye peeled for program bugs. *Query!*[2] passed all tests without a significant software failure. A few bugs did surface, though, but only of the minor-annoyance species.

For example, I tend to rely on the type-ahead buffer wherever possible. At the computer keyboard, patience, frankly, is not one of my strongest virtues. So in *Query!*[2] I skipped along at full throttle once I could anticipate the program prompts. For reasons unexplained, moving ahead in such fashion consistently resulted in Strange Encounters of the Third Kind.

In particular, typing only three characters in the keyboard buffer while loading View, the data retrieval program, causes DOS to be reloaded, but not before *Query!*[2] displays the frightening message: Your Database File Is Corrupt! I reached for a rosary, rattled off the better part of a novena to the patron saint of databases, and then retried the procedure—without typing ahead. The program executed flawlessly, and to my everlasting relief the database appeared intact. Obviously, it was *Query!*[2] that was corrupt.

Barebones

Overall, *Query!*[2] weighs in as a barebones, get-the-job-done system with no sugar-coated documentation or fancy user interface. At its former cost of $29.95, you couldn't go wrong. At $99.95 (plus $19.95 for a practical report generator), *Query!*[2] may still beat many of these in dollars alone, but there the advantage ends.—**Edward Joyce**

BEAST DATA MANAGER: Mild Mannered and Competent

You might think that a product named *BEAST* would be a good game for the kids to play on your new PC*jr*. In fact, *BEAST DATA MANAGER* is a Rolodex-style data manager that's easy to use and, with one big exception (and a small objection or two), offers reasonable value and performance for its $115 price.

What's the big exception? The current version of *BEAST* does not allow you to have two entries in a file with the same index value. If you're using it for an application as simple as a Christmas card list that uses last names for the index, you'll have to fake it into accepting entries for brothers or sisters that you exchange cards with! You can get around the problem by using a different index (in this case first *and* last name), but you may have trouble even then (for example, if you have two cousins with the same name on your list).

The largest of my small objections to *BEAST DATA MANAGER* is that you cannot restructure the file design if you run into problems with the design you started with. Once *BEAST*'s Create program has finished its job, you have no opportunity for backing up and changing things. You have to start over from scratch. Since *BEAST* does not have a data import facility (although it does have an export facility), this could prove disastrous if you find yourself well into an application before discovering a serious data design problem.

BEAST DATA MANAGER
Stanton Software
P.O. Box 173
Stanton, NJ 08885
(201) 236-6842
List Price: $115
Description: Flat file.
Requires: 96K RAM, 1 disk drive.
Records per File: 90 to 4,000 depending on record size and disk space.

CIRCLE 717 ON READER SERVICE CARD

BEAST's brief user manual will have you guessing a few times before you get the system backed up and running.

Out of the Cage

BEAST's brief (but, unfortunately, not always to the point) user manual will have you guessing a few times before you get the system backed up and running. An experienced PC user will not have very much trouble getting started, but a novice could easily get confused the first time *BEAST* is let out of its cage. Once you finally get the package going, though, it's so simple to use that you'll have trouble forgetting it.

BEAST allows you to build data entry, inquiry, modification, and deletion

```
Department: Shipping          Last Name: Brady          First Name: Anna
                                Address: 99 Spruce Place
                          City, State  Zip: Evansville          , IN  46514
    Salary:       14800 Employee Number: 348930

Department: Shipping          Last Name: Horton         First Name: Maggie
                                Address: 2399 Cypress Rd
                          City, State  Zip: Portland           , OR  97227
    Salary:       14300 Employee Number: 278573

Department: Shipping          Last Name: Carver         First Name: Abe
                                Address: 101 Mayflower St
                          City, State  Zip: Baton Rouge        , LA  70802
    Salary:       13500 Employee Number: 604039

Department: Shipping          Last Name: Bayliss        First Name: George
                                Address: 27 Lenbrook Lane
                          City, State  Zip: Knoxville          , TN  37918
    Salary:       13500 Employee Number: 103850

Department: Shipping          Last Name: Kositchek      First Name: Chris
                                Address: 99 Bingham Dr
                          City, State  Zip: Dallas             , TX  75220
    Salary:       13100 Employee Number: 503820

Department: Shipping          Last Name: Williams       First Name: Julie
                                Address: 12 Horizon Hill Dr
                          City, State  Zip: Poughkeepsie       , NY  12603
    Salary:       13000 Employee Number: 483640
```

A screen layout for an employee record in *BEAST*.

screens any way you want to once you've defined your file's data fields. The program's screen painter makes it easy to create screens that look just like you want them to, containing only the fields necessary for the function you have in mind. You may wish to have different arrangements for up to 50 fixed-length items for each purpose, and more than one arrangement for a function such as data entry or modification.

BEAST DATA MANAGER allows up to 20 different screens for each file, a feature that can be useful in a system where different users may have access to the data but certain fields shouldn't be seen, entered, or modified by everyone. Once your screens are defined, you arrange *BEAST*'s access menu by telling the system which PC function keys get you to which data screens.

Belly of the Beast

Entering data into *BEAST* is no more difficult than typing on the PC's keyboard. There are no special tricks, although you do have to get used to its auto-entry facility, which takes the cursor to the next item as soon as you fill in the last character. If you mistype the last character you have to manually move back (Shift-Tab) to the flawed field to correct it. To have *BEAST* accept all of the fields into the record, press the F10 key.

Entering data into BEAST is no more difficult than typing on the PC's keyboard. There are no tricks, although you do have to get used to its auto-entry facility.

One restriction that can make *BEAST* difficult to use is that the retrieve, modify, and delete functions are accessible only if you specify a record's index value. If you happen to forget the index value of the record you're looking for, you're plum out of luck. Fortunately, *BEAST*'s quick-report generator will fill in, at least for retrieving records. If you manage to remember the value or approximate range of another data characteristic of the record you're looking for, you can find it by using the report generator's search specification facility. If you need to modify the record, you can return to the modify function after finding it with the report generator and noting its index value.

Beastly Reports

The report generator is as easy to use as the rest of *BEAST*. Like the data entry screens, report formats are painted on your PC screen so you can see what the format will be for each record when it's printed. *BEAST*'s report generator does not allow headers or footers, but field titles can be anything you want, up to 24 characters. If you want, you can direct your report's output to the screen instead of the printer, and the report generator is also able to format files for mail-merge applications or standard ASCII sequential files. You can save up to 20 report formats, or you can define one for one-time use and then delete it.

Printing the reports or exporting files is easy once you learn how to specify your requests using *BEAST*'s BASIC-like selection language. You can specify multiple-sort fields (with ascending or descending order as an option), and you can request a break line to be inserted whenever a value change occurs in a sort field. The sort and select fields do not have to be in the report format you are currently using.

A spokesman at Stanton indicated that the unique index problem is being investigated and may be revised soon. If that problem is fixed, the others are minor enough to put *BEAST* right up there as an excellent buy for users of small databases.

—John Dickinson

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CIRCLE 326 ON READER SERVICE CARD

Data Design: Simple but Slow

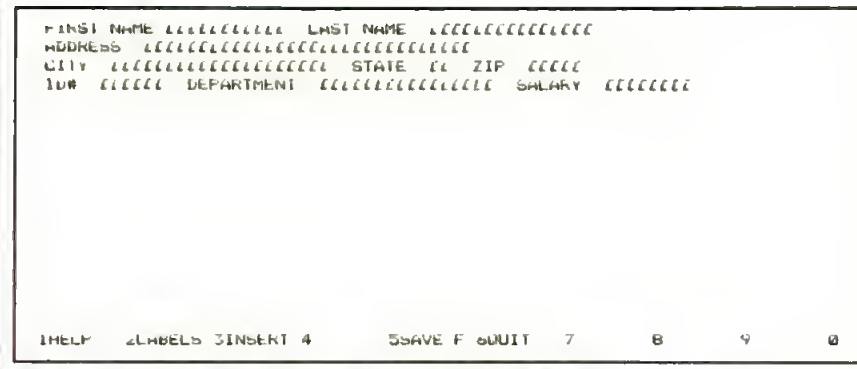
Insoft's *Data Design* is a record management system with numerous features to extend its usefulness, but, like all record management systems, it has limited utility. It is not really a database management system—it cannot deal with groups of related data. Indeed, this system lacks even a rudimentary Query language, although one is promised in the near future. The system can sort records on any field and can select which records from the database will be printed. *Data Design* also implements computed fields, (summary statistics for selected records can be computed as part of printing a report), and the latest version includes exponentiation.

Data Design is easy to learn and easy to use. It provides a simple way of defining tables and forms to receive information and an even simpler mode of data entry. The user can either browse through individual records on the screen or print them. Commands are presented on a menu with clear choices. The main menu consists of ten commands, each of which is called by a function key; the F1 command summons a Help menu, and F10 returns the user to DOS. The documentation is good, but *Data Design* is so easy to learn that the manual is hardly necessary.

The system deals with records one at a time, fetching each one from the disk and then outputting it to the printer or screen. This makes *Data Design* annoyingly slow. It's a shame, because otherwise it's a very nice system.

Data Design
Insoft
10175 Barbur Blvd.
Beaverton, OR 97219
(503) 641-5223
List Price: Not available.
Description: Flat file.
Requires: 64K RAM, 2 disk drives.
Records per File: Limited by disk space.

CIRCLE 718 ON READER SERVICE CARD



An employee record input screen created in *DATA DESIGN*.

Defining Record Structure

The record structure for each dataset is defined from the Table menu; the choices are to MAKE, EDIT, GET, SAVE or QUIT. To create a table, you simply name each field, specify whether it is text or numeric, and give the field length. Though the field names can be only eight characters in length, text fields can have up to 79 characters, and numeric fields can be up to 16 characters. Each record can contain up to 40 fields.

One problem occurred when defining test records. The strict choice between text and numeric data types precluded formatted field types such as date, time, and social security numbers. Hence, it is impossible to compute the time between dates with this system.

The form is a way to look at data and to arrange and format the fields for each record. *Data Design* gives a blank screen on which to paint the form. Each field, for example, can be preceded by a descriptive phrase such as "Employee Number:"; the phrase can be typed anywhere on the screen—just move the cursor and type. The location for field data is set by movng the cursor to the desired location, hitting F3 to indicate that you want to place a field there, and entering the name of the field. *Data Design* then highlights the space you have allotted for entering data in that field. Hitting F2 reminds you of field names,

types, and lengths and tells whether or not they have been used.

Any or all fields can be indexed and later used as the basis for sorting records. When inserting the field onto the form, placing an "at" sign (@) in front of it indicates that *Data Design* should index this field. Similarly, a computed field can be designated by preceding the field name with an exclamation point.

To browse through the records in a dataset, the user must select a table (a set of records) and a form, and then select the field on which to sort the records. The sort can be based on more than one key field (for example, last name and first name) but re-indexing the records is very time-consuming. The function keys are set up for moving forward or backward through the records and any record can be selected with LOOKUP. The BROWSE command is also used for editing existing records or

for adding new ones; F2 activates the ENTER MODE, F4 MODIFY, and F5 DELETE.

Getting started in PRINT is just like BROWSE: select the table, form, and indexed field to print. *Data Design* lets you set up headers for each page; the titles can be automatically centered, and they can include the page number and the date. Summary statistics for the report can be selected for the numeric fields; the statistics include COUNT, SUM, MAX, MIN, AVG. Records can be selected by comparing any field's value to a specified text or numeric value—PRINT will select records based on the operators <, >, =, or ! (less than, greater than, equal to, or not equal to). So, for instance, records on the members of the DiMeara clan could be selected and printed by typing LASTNM = DiMeara. The output can be sent either to the printer or to the screen, but no special printer codes are available. It would be nice if the selected information could be output to disk in ASCII format, since this would enable the results to be used with other programs. The PRINT specifications can be saved in a report file for later use.

Other Features

Data Design has three other major features which deserve mention: a backup and recovery system, import/export, and telephone communications.

As advertised, the backup system did recover a table (really a database) that was messed up when a floppy ran out of space; it also purged sample data from a table. I spent more time with the Import function that I care to discuss; it worked fine with comma-separated files, but it was extremely difficult to import fixed-length files—I never did get the numeric fields imported correctly. DIF files can also be imported or exported. *Data Design*'s telephone communications system might prove very useful to some businesses; it includes auto-dial and auto-answer, but only the baud rate parameter can be set from within *Data Design*.—**James Perotti**

RANK AND FILE I: Excellent Simplicity

Sages and scholars have long observed that art resembles the artist. I've often thought the same of programs. They reflect the personalities of their creators. By knowing the programmers, one should be able to roughly assess the predominant traits of ensuing compositions.

Let's follow this reverse logic briefly with a case in point: *RANK AND FILE*, one of the newest arrivals in the arena of electronic filing systems.

RAF was developed by two 24-year-old programmers who graduated from a progressive computer-science program where microprocessors are as ubiquitous as hand-held calculators. Their quest to create an electronic filing system was unencumbered by the conservative approaches that often earmark traditional database designs. Their foray into the retail markets of software has sapped most of their assets except for a pair of fast sports cars.

What kind of software results from that kind of parentage? Rather than answering point-blank, I'll let *RANK AND FILE* speak for itself.

Logical Disks

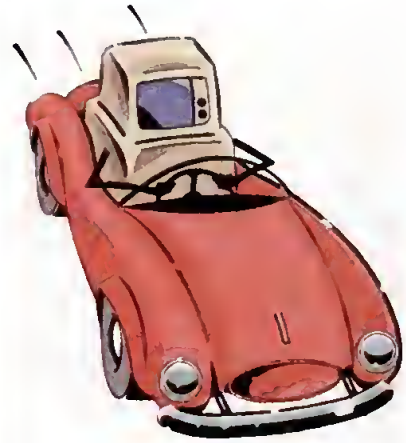
RAF is centered on the concept of an electronic file cabinet. Each cabinet comprises a logical disk. Under PC-DOS 1.1, this means one cabinet per disk. That's another way of saying one file per disk, a restrictive stipulation that few users could live with.

Under DOS 2.1, however, this restriction vanishes in wake of the subdirectory structure. Subdirectories support multiple logical disks per physical drive. *RAF* takes advantage of this ability to allow numerous file cabinets on a drive; you're only constrained by the subdirectory limit. The underlying concept is cleverly simple—one drive, one cabinet. DOS handles the dirty work of logically separating the files.

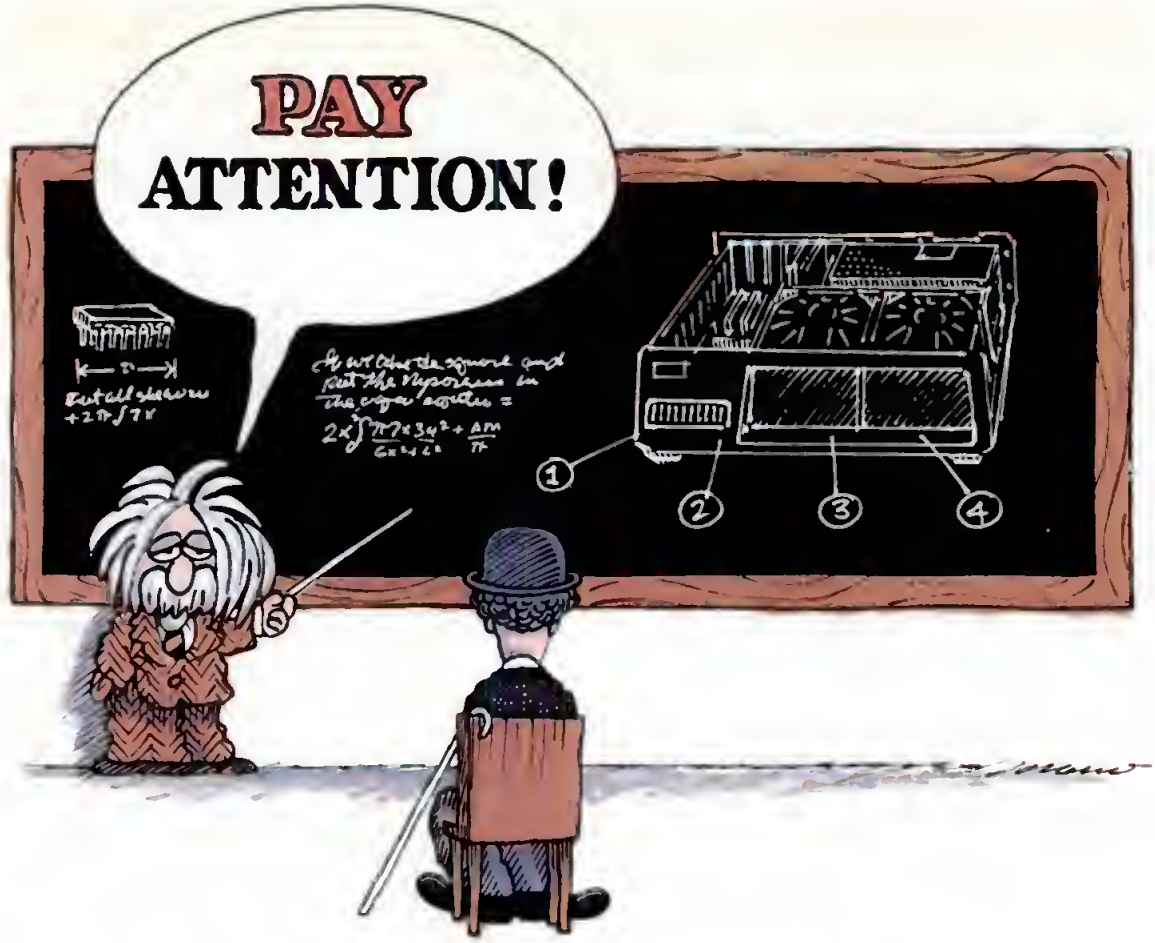
This simple, straightforward approach characterizes the entire system. Consider the file structure: If you ask the majority of database developers what methods they use to access records, 95 percent will evade the question by answering "proprietary," or "trade secret." If anything,

RANK AND FILE
RAF Software, Inc.
P.O. Box 32338
San Antonio, TX 78216
(512) 366-1057
List Price: $160
Description: Flat file.
Requires: 128K RAM, 2 disk drives.
Records per File: 65,535.

CIRCLE 719 ON READER SERVICE CARD



RAF was developed by two 24-year-old programmers who graduated from a progressive computer-science program.



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CIRCLE 187 ON READER SERVICE CARD

they may concede a unique hybrid of state-of-the-art techniques, but the discussion stops there.

RAF, on the other hand, depends on no secret access mechanism. Everything's sequential, pure and simple. No space compression, no tree indexes, not even a sorted order.

Speed of Search

Well, there's obviously little overhead in such an arrangement, but searching must take forever, right? Again *RAF* defies conventional wisdom. The system flies like the dickens.

The *RAF* programs acquire this speed in two ways: They're written in assembly language modules, which execute not one extra instruction of overhead. More importantly, though, the programs' buffer files up to 64K. The net result is that after records are read into the memory buffer, the disk drive rests except when it updates records, which are "written through" the buffer to the disk media.

Using the 25-record file, I performed the prescribed ad hoc queries on fields and combinations of fields. As quick as you press the F1 key, which fetches a record, it's there. Pow—instant information.

Unfortunately, I couldn't run benchmark tests on *RAF* for the 500-record file, since it has no import capability. I did, however, exercise it with a sample 30K file that comes bundled with the system. Queries on this dual-screen invoice form executed as rapidly as on the small file. No degradation was evident.

For file cabinets that exceed 64K, *RAF* pages segments as required from disk. But 64K covers a considerable area. That's almost 600 of the 113-character employee records we've been dealing with in this series of reviews.

RAF Perks

In addition to speed, the system offers other noteworthy attributes missing from many competing packages. The status of the CapsLock and NumLock keys is constantly monitored and displayed on the screen. A minor convenience, still you don't have to type a string of characters to determine the state of the locks.

The report generator has an option for calculating running totals, which are displayed on the screen as the report is printed. I can't think of an immediate application for this. Nonetheless, it's there for the discerning user.

A report feature that I did find very handy permits you to print only a summary. You can use it to review grand totals without being inundated with pounds of continuous forms listing unnecessary detail.

Finally, *RAF*, in a manner of speaking, supports data exporting. There's no export function on the menu, but there's no need for one either. All file cabinets are stored in standard DOS ASCII format. Again, simplicity reigns.

Viewing the *RANK AND FILE* package with the eye of a skeptic, I perceive most weaknesses in the operator interface area. In the Add mode, requests for online assistance, which is generally available throughout the system, are ignored even though an abbreviated menu suggests pressing F10 for help.

At times, the program prompts you with a flashing cursor. At other times, no cursor appears. A subtle inconsistency, yet one that the connoisseur would question.

As with so many other products, the gravest problem is the documentation. Thirty photocopied sheets accompany the software at this writing. The manufacturers refer to this "manual" as the embryo for a professional typeset manual scheduled to be available by the time this article appears in print.

By any measure, *RANK AND FILE* clinches the title on my scorecard as *the* electronic filing system for personal and small business use. All of the software fits on one diskette with room to spare. The programs could stand a little polish, but in the meantime, the system works like a charm, and future updates will be available for a handling fee of $15.

Other systems try to masquerade simplicity with exhaustive user guides, thorough tutorials, and verbose help screens. *RAF* delivers simplicity by distilling simplicity. And as Longfellow once observed, "In all things, the supreme excellence is simplicity."—**Edward Joyce**

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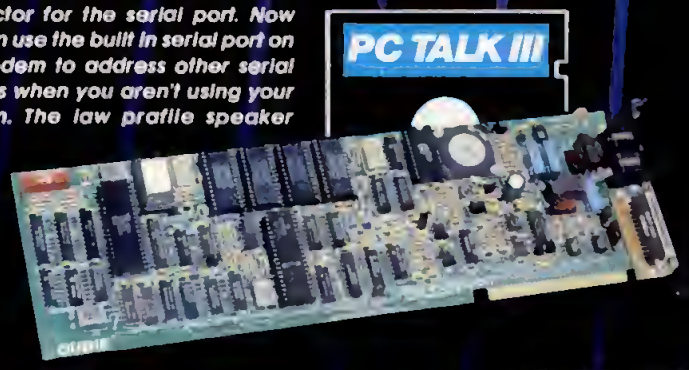

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Stress Tests For Floppies

Have you ever wondered just how dangerous to your disks the common hazards are? Hands-on testing reveals the surprising truth.

Many people take only average precautions against life's numerous hazards. They stop, look, and listen when they cross the street and stay out of city parks at night—nothing unusual, and even then, the approach to safety is casual. But when many of these same persons, working with their PCs, are handling floppy disks, they act as though they're balancing a stack of Meissen china. They treat disks so gingerly and with such smothering protectiveness that one is forced to ask, How vulnerable are these magnetic masterpieces?

Now that computers have moved from their once pristine preserve—the alleged cleanliness of the white-collar office—into all types of commercial and industrial environments, the question of diskette vulnerability has become acute. If, like the rest of us, you must occasionally take your disks into the real world, you may have wondered just how vulnerable they are to

Illustration: Cary Henne

such environmental hazards as humidity, heat, industrial contaminants, and electromagnetic force. Over the years, myths have sprung up surrounding the vulnerability of magnetic media to damage. It has even been rumored that mainframe computer tapes transported on New York's subways were rendered unuseable by the powerful magnetic field of the electrified third rail. To confirm or deny stories like this, I decided to see how much torture a disk could take before losing its data.

Medieval Methods

My method was to subject identical disks to a number of ordeals of truly medieval severity, to test their susceptibility to three kinds of stress: physical, chemical, and electromagnetic. As a first step, I bought two boxes of IBM double-sided disks at a nearby IBM Product Center. Each disk was formatted on a 128K, monochrome IBM PC, on the same double-sided drive (a half-height unit made by Shugart) with DOS 1.1. Using the standard DOS format command, I processed the first disk, and when DOS asked "Format another (Y/N)?" I replied Y (for yes) 19 times in a row.

Using *EasyWriter 1.1*, I created 18 distinct files of identical length on one of these disks, each consisting of a single, repeated letter or character. Finally, I duplicated the master disk by inserting it into drive B:, placing a blank (formatted) disk in drive A:, and typing the DISKCOPY command. The DISKCOPY procedure finished the first duplication by asking if I wanted to copy another, to which I replied Y 19 times more. I thus created 20 identical disks, all on the same drive within an hour of each other. The idea was to simulate real-world conditions by moderately filling each disk with data.

To be certain I did, in fact, have 20 identical disks, I spot-checked files on a few disks randomly, using the DOS utility TYPE. The advantage of this approach is that it creates a pattern on the screen that makes it easy to catch an error. No errors were found, however.

Many people, when handling floppy disks, act as though they're balancing a stack of Meissen china.

After these preliminaries were complete, I took some of the disks down to the local torture chamber, Sylvester Testing Labs in Rockland, Massachusetts. Sylvester, a lab specializing in metallurgical and materials testing, subjected the disks to five different stresses: corrosive gas, X-rays, humidity, thermal shock, and the magnetic field generated by a welding cable.

For the first of these, a disk was placed for 72 hours in a plexiglass test chamber containing 1 percent carbon dioxide. This test was repeated in an environment of 0.5 percent sulfur dioxide. A Picker X-Ray Corporation X-ray camera then irradiated one diskette with 120 kvm for 1 minute at a distance of 36 inches from the source. A second diskette was irradiated with 250 kvm, also for 1 minute at 36 inches. (By comparison, a conventional chest X-ray emits 120 kvm for only .005 seconds at a distance of 72 inches.) Things got more interesting with the next two tests. A disk was placed in a humidity chamber for 24 hours, and exposed to air with a relative humidity of 85 percent, ±5 percent, at a temperature of 25°C, ±2°C. Then, in a moment of vaguely sadistic inspiration, another disk was subjected to thermal shock.

Thermal shock occurs when disks are taken from a cold environment, such as outdoors in the winter, into a warm environment, such as an office building. Although it seemed unlikely that thermal shock would affect magnetic impulses on a disk, this test was performed because it simulates a reasonably common situation.

Two diskettes were subjected to −80°F for 1 hour, and then to 180°F for 1 hour in a Tenny thermal shock chamber. The test lasted 2 hours. Finally, a Miller welding machine running on 115 amps DC was turned on, and two disks were subjected to the resulting magnetic field. One disk was placed 1 foot away from the cable, while a second was placed 2 feet away.

Having exhausted the ingenuity of the professional testers at this point, I was thrown back on my own resources for the completion of the testing. My aim was to investigate the effects of several common sources of electromagnetic stress, including ordinary magnets, a telephone receiver, a microwave oven, fluorescent lights, a color television, a calculator, and more. Since information is stored on disks as magnetic impulses, virtually the first thing computer users learn is that magnetic media of all sorts should be kept away from sources of magnetism. But has anyone ever actually tested for the effects of magnetism? I took a hardware-store variety magnet and moved it back and forth parallel to the surface of a disk, approximately 2 to 3 inches away. I did the same with another magnet back and forth on the

Tyvek envelope with a different disk inside.

Reach Out and Touch Some Data

According to a Verbatim Corporation spokesman, telephone receivers have been known to destroy the integrity of data. With the disk in its protective Tyvek envelope, I conducted a 10-minute conversation, during which time I rubbed the disk repeatedly over the transmitter, receiver, and base of a standard Bell System touch-tone phone.

Although the proximity of floppy disks and phones is not so farfetched, how likely is it that floppy disks will end up in a microwave oven? Nevertheless, microwaves are all around us—outside (from various communications services), in business/commercial environments, and in homes (microwave ovens). To put the disks to a sufficiently severe test, I went to a local department store that sells several brands of microwave ovens. When the salesman's back was turned, I slipped one disk into a Sharp Model 771R Carousel microwave oven (oven 1) for 1 minute, set at medium-high. A second disk was placed in a Litton Corporation Generation II microwave oven (oven 2) for 90 seconds, with the controls set for a well-done hot dog.

Since microwave cooking works by heating up water molecules, I expected the disks to come through physically unscathed. (The point, after all, was not to fool with the physical or mechanical attributes of the disk, but with its magnetic data record.) Apparently, the Litton oven heats up inside, since the disk came out looking like a record left on a car dashboard in the August sun. The other disk came out physically unscathed; I suffered only minor embarrassment when discovered by incredulous store personnel.

The spokesman for Verbatim Corporation also indicated that fluorescent lights can clobber data recorded on a floppy. (Fluorescent lights contain a transformer-like component called a ballast, which apparently can have an adverse affect on

What's the Matter with Particulate Matter

When a mishap gums up your disk with lasagna, head for the sink and follow these directions.

Damage to disks doesn't come only from exotic sources. One Sunday night you're showing off your computer to the family, and while you're sitting there putting it through its paces, your destructive, 6-year-old nephew decides that a piece of lasagna would look good sitting on top of one of your disks—the one you've worked on all weekend for a major presentation to your boss at work the next day.

What to do? First and foremost, don't panic, advises Jack Stollery of Verbatim Corporation, a California manufacturer of magnetic media. After you've recovered your aplomb, Stollery suggests rinsing the disk thoroughly and doing an emergency disk transfusion. Here's how to proceed:

1. Carefully rinse off as much of the lasagna as you can, using cold or cool water.

2. Carefully slit one end of the protective PVC jacket holding the disk. Put on a pair of white, lint-free cotton gloves (the kind sold in photographic stores for handling negatives and prints), remove the actual disk, and rinse it off several times. (The technical phrase for washing off the lasagna is "removing the particulate matter.") Throw away the jacket.

3. Carefully slit the jacket of a good disk and insert the questionable disk into the good jacket. Don't attempt to tape up the slit end.

4. Copy the now jury-rigged disk onto a regular disk; with any luck you'll have recovered your data.

Stollery also had these suggestions for enhanced disk life:

- Buying a disk notcher, to make double-sided disks out of single-sided ones, is a false economy. The notching device actually tears the plastic-based disk envelope and increases the chances of contamination (and therefore of head crashes).
- When a disk is to be mailed, insert it first into a Tyvek envelope. Individuals often insert disks between two pieces of corrugated cardboard (in a kind of a sandwich) without benefit of Tyvek. The only problem with this is that cardboard has lint, which can get onto the disk.

Stollery also made a suggestion that will be familiar to music enthusiasts who use magnetic recording tape: Never, never buy non-brand-name diskettes. The savings of a few dollars could conceivably wind up costing hundreds, if oxide particles or other imperfections of inexpensive disks cause a head crash.

—H.A.K.

CIRCLE 295 ON READER SERVICE CARD

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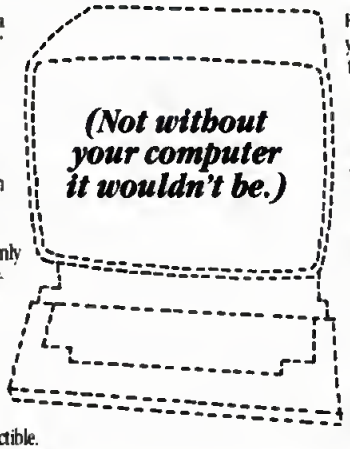

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STRESS TESTS

radio receivers. Transformers generate magnetic fields; I thought perhaps a ballast might, too.) Two of the test diskettes (both in their Tyvek envelopes) were rubbed along a conventional fluorescent light in the writer's office and against a fluorescent desk lamp in which the ballast and other electrical items were encased in a separate unit.

> My method was to subject identical disks to a number of ordeals of truly medieval severity.

Passing through the ubiquitous airport X-ray security machines is now so commonplace that it would be easy to carry an attache case through forgetting that it contains diskettes. Would you be sorry if you did? To find the answer, I walked up to the person manning the X-ray device at the Eastern Airlines Shuttle terminal at Boston's Logan airport and confidently asked the security guards manning the entrance if they'd mind putting the diskette case (containing two diskettes) through their examining machine four or five times. Although they looked at me a little peculiarly, they relented when I nodded confidently that they hadn't misunderstood me. I was conducting research, I explained, and wanted to see just how much abuse the diskettes could take. The chap running the machine assured me that the disks would be erased or at least adversely affected.

Airplanes aren't the only dangerous mode of transportation for disks. Cars create hazards, too. An automobile's ignition system produces high-frequency voltage to ignite the gas mixture. With the diskette in an envelope to protect it from grease and other contaminants, I moved it over and around the ignition coil, ignition wires, and engine of a 1983 Toyota Tercel station wagon while the engine was running.

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The final test for the disks was trial by television and calculator. Color televisions use high voltage to operate the picture tube, and a television set has numerous transformers. For good measure, I took one of the disks (as always, in its Tyvek envelope), tuned in an RCA XL 100 19-inch color television to a daytime soap opera, and rubbed the disk over each of the set's six surfaces. Additionally, I keyed some figures into a several-years-old Sharp Compet CS-2108 desk calculator and rubbed the disk all over the device.

Only the Strong Survive

It's obvious that floppies are much more robust than commonly believed. Two tests caused physical damage to the disks—the Litton microwave test and the thermal shock test (which caused heat distortion of both disks). That's not surprising, since the IBM Tyvek envelope recommends keeping the disk between 50 and 125° F. In addition, the American National Standard Institute's specification for floppy disks, ANSI # X3.82-1980, a detailed, 19-page document covering almost every aspect of diskettes, states that they should be able to withstand operation and storage in that range and at a relative humidity of 8 to 80 percent. The only test that resulted in a data loss (without physical damage to the disk) was the one that involved passing a magnet over a disk in contact with the Tyvek envelope.

These results are substantiated by the conclusions of a 1983 publication of the National Bureau of Standards, which found that magnetic tapes are unaffected by the following: radar systems, airport metal detectors, X-rays, high voltages, nuclear radiation (gamma rays), automobile interiors, light and laser beams, and pressure (other than that causing physical distortion of the media). Static electricity by itself was not found to cause any data loss, and television receivers were regarded as having some (slight) potential for damaging tapes. Apparently, major United States tape and disk manufacturers have conducted little or no research in these areas of disk vulnerability.

Nevertheless, it's always possible that a particular energy source might use stronger fields than the ones I exposed the test disks to. So, it's always a good idea to give disks the same TLC you'd give any valuable, fragile object. ■

Hazards	Results
Physical/Chemical Hazards	No effect
Humidity	
Corrosive gases	No effect
Radiation Hazards	Warped disk
Thermal shock	
Microwave oven 1	No effect
Microwave oven 2	Warped disk
X-ray machine	No effect
Airport security machine	No effect
Magnet at 2 to 3 inches	No effect
Magnet rubbed over protective envelope	Unreadable disk
Welding cable	No effect
Auto ignition system	No effect
Telephone receiver	No effect
Fluorescent lights	No effect
Color TV	No effect
Calculator	No effect

A summary of the effects of various hazards on the integrity of a disk's data.

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The Elusive 3270 PC CONNECTION

IBM's 3270 PC is a multitasking micro with a mainframe link, but it isn't the ultimate answer in the quest for communications.

Call me an optimist. I have always had an interest in the elusive and much-discussed "micro-mainframe link," so I jumped at the chance to preview IBM's 3270 PC. Visions of a superpowerful IBM software/hardware combination heightened my sense of anticipation on the way to the demonstration. I wanted to be impressed.

Hardware

The IBM 3270 PC is an expanded version of the PC-XT. Its system unit seems identical to that of an XT, although the IBM representatives said that XT cannot be expanded into the 3270 configuration. Add-in multifunction cards reportedly will run with little or no modification.

The first noticeable difference is the expanded keyboard, which contains 122 keys in a completely new layout. The standard function keys, F1 to F10, have been moved to the top of the keyboard and the keys F11-F24 have been added. These 24 keys duplicate the functions of the 3270's PF1-PF24 keys; in addition, F1-F10 perform the regular PC functions when you run a PC-DOS program. Now occupying the old function key positions are control keys for operations such as changing windows and copying data. There is also a special controller board to interface with this keyboard.

Although the system can use the IBM monochrome display, all the machines I saw were running with a new color monitor measuring 14 inches diagonally. The display electronics in the system unit are

Photography: Terry Hourigan

decidedly nonstandard: an APA (All Points Addressable) card, a PS (Presentation Space) card, and a Display Adapter that is similar to the color/graphics card on a standard PC. An internal ribbon cable connects the first two boards to the Display Adapter.

The eight-slot motherboard can also hold a parallel printer card to connect with the IBM PC printer, a Mainframe Adapter card to interface with a 3274 control unit, a floppy disk interface card, a standard asynchronous card, and the keyboard controller board. If you've been keeping track of the card slots, you'll notice that they've just been used up. So where do you put the required hard disk controller board? You must forgo one of the above devices. The asynchronous capability will usually be the one sacrificed, but you can also save a slot by using the Monochrome Adapter, since it does not support the APA board.

Software

Two concepts are important to an understanding of the software side of this machine. The first is called presentation space. The 3270 PC software allows the machine to handle up to seven different tasks or "sessions" at one time. Presentation space is the theoretical (as opposed to physical) area containing the data that goes to your display screen from each session. This concept exists across CPU families in the IBM product line.

The second important concept is the window, which lets you see the text and/or graphics that are actually in your presentation space. Each window can be made as large as the entire screen or as small as one character, and you can scroll within windows. Each session uses its own window area to communicate with the operator, so there can be up to seven windows on the screen at any given time. There can be as many as four "host sessions" (IBM's term for the actual 3270 link), one or two "notepad sessions" (scratch areas of the screen that may be used for copying data), and a personal computer session that works like a standard PC-DOS system. (See Figure 1.)

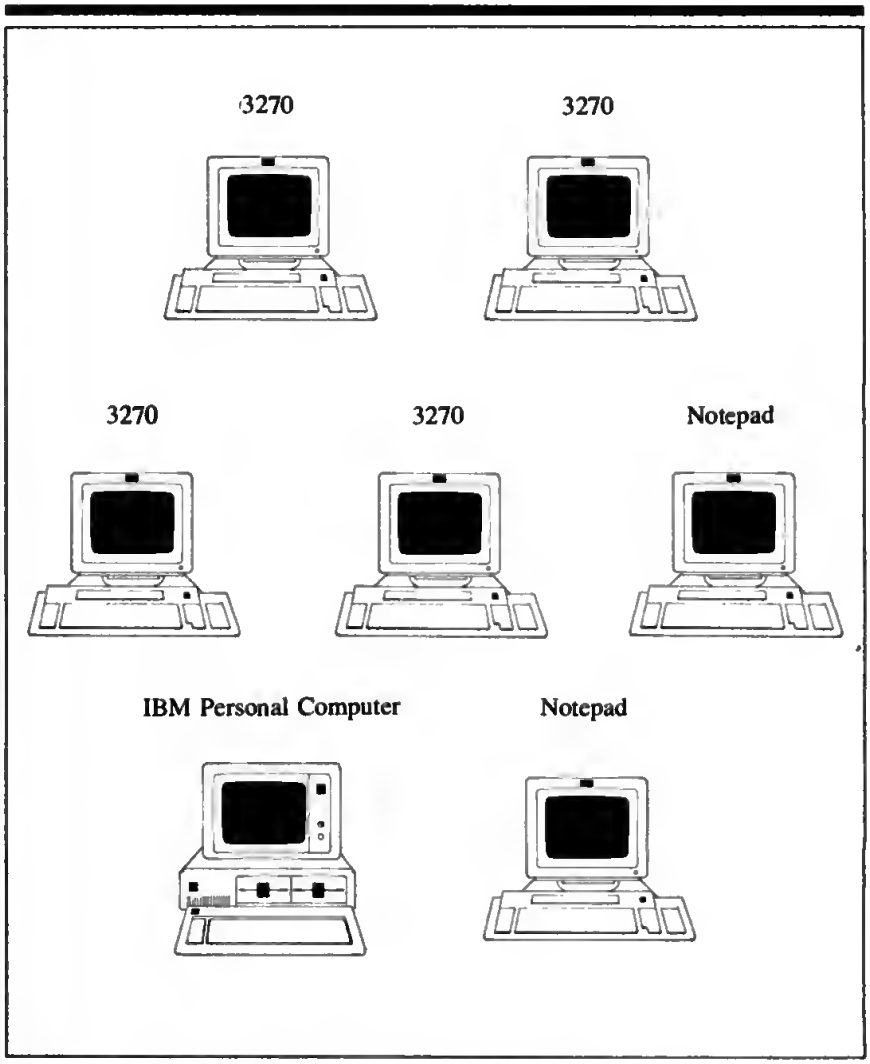

Figure 1: *The 3270 PC's windows allow you to display up to seven sessions simultaneously, including four "host" and two "notepad" sessions.*

As noted above, the 3270 PC can interface with a 3274 control unit, appearing to the host computer as up to four 3278 Model 2 terminals. This might be useful to someone who needs to run multiple programs on a mainframe concurrently. Data from the mainframe may be saved to the system disk for later use by another program, but presently there is no way for a PC-DOS program to communicate directly with the host computer.

File up- and downloading are supported. IBM has developed a program on the mainframe that provides a custom interface for the 370 PC software, maintain-

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List Price: System unit with 256K RAM, keyboard, one disk drive, display adapter, $4,290; color monitor, $995; control program, $300.

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ing a PC-DOS-like directory. An interesting problem came up, however, when I tested this feature. I asked the IBM demonstrator to send a copy of COMMAND.COM from the PC-DOS diskette to the mainframe; then I requested that he bring it back down. You can imagine his chagrin when the file that came back was 16 bytes longer than the original! We tried the same thing with a file created by *1-2-3*, and it came back 84 bytes longer! After much consternation, the IBM officials present determined that they still had "some homework to do on this one." Apparently the mainframe block size has something to do with the problem, which IBM promises to correct in the next release. By the way—*1-2-3* had no problem reading the extended file.

The machine supports 3279 GDDM graphics on screen, but for some reason it will not print these graphics on the printer; you have to print your graphics at some other station or at the host site.

The asynchronous communications option is identical to that of the standard PC. IBM demonstrated the Dow Jones Spreadsheet Link, putting data onto the disk and then sending it to the mainframe. Be advised that an external modem is still required, although I could not determine whether the add-in modem boards would work with this system.

I found the communications capabilities generally disappointing. Why can't I maintain my *dBASE II* data file on the host and an index file on the micro? Why can't I use *1-2-3* to read a spreadsheet directly from the mainframe without first downloading it? Sure, file up- and downloading are useful, but I can get that capability with other products at a much lower cost. The demonstrators weren't even sure if I could perform the file transfer from a PC-DOS batch file.

Other Limitations

Since the 3270 PC can run only one PC-DOS session at a time, it does not have the same capability as Concurrent CP/M-86 or even Microsoft Windows. An MS-DOS can, however, be running while communications are taking place with the host computer.

The 3270 PC's keyboard, with 24 function keys.

Sure, file up- and downloading are useful, but I can get that capability with other products at a much lower cost.

The folks at IBM claim that most PC-DOS software will run unmodified on the 3270 PC, but most of the programs they demonstrated for me were modified to compensate for the increased screen size, particularly graphics-type programs. If, for example, Digital Research's *DR-GRAPH* package were run unmodified on the 3270 PC, the aspect ratio would be incorrect, so a special version is required.

Is the system easy to use? Not very. IBM provides a nice on-line tutorial program, but you would need the patience of a saint to sit through the whole thing. You can use a single-keystroke JUMP command (F5) to go from window to window in order, but accessing any given window at random requires that you exit the current window with one keystroke, change windows with a second keystroke, and enter the new window with a third. Forget about a mouse. Where would you put the interface board?

There are no real on-screen menus, but most of the keys are clearly labeled, possibly obviating the need for menu prompts. I also believe that most untrained operators of this terminal will have a hard time understanding the concept of a PC-DOS session running concurrently with four mainframe communications sessions, but in all fairness, this could be essentially hidden from the user with an AUTO EXEC or batch file.

I was not impressed by the 3270 PC. IBM apparently decided that to go half way was better—or perhaps cheaper—than to go all the way. The 3270 PC would make a nice programmer's development terminal, with its multiple 3270 sessions running concurrently, but I don't think it will find its way into most general data processing work. A real 3278 is still much cheaper, and most PC users will continue to rely on third-party vendors for 3270 emulators that run under PC-DOS. It seems the perfect micro-mainframe link still eludes me. ■

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Please will supply you with labels for a mailing to selected customers. It can send customer information to your word processor for a promotional letter. And it can receive data from your spreadsheet program. *Please* will even look up a name and company for you, your Hayes Smartmodem* will dial the phone number, and you're ready to talk!

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CS-5 Adds Depth To PC Graphics

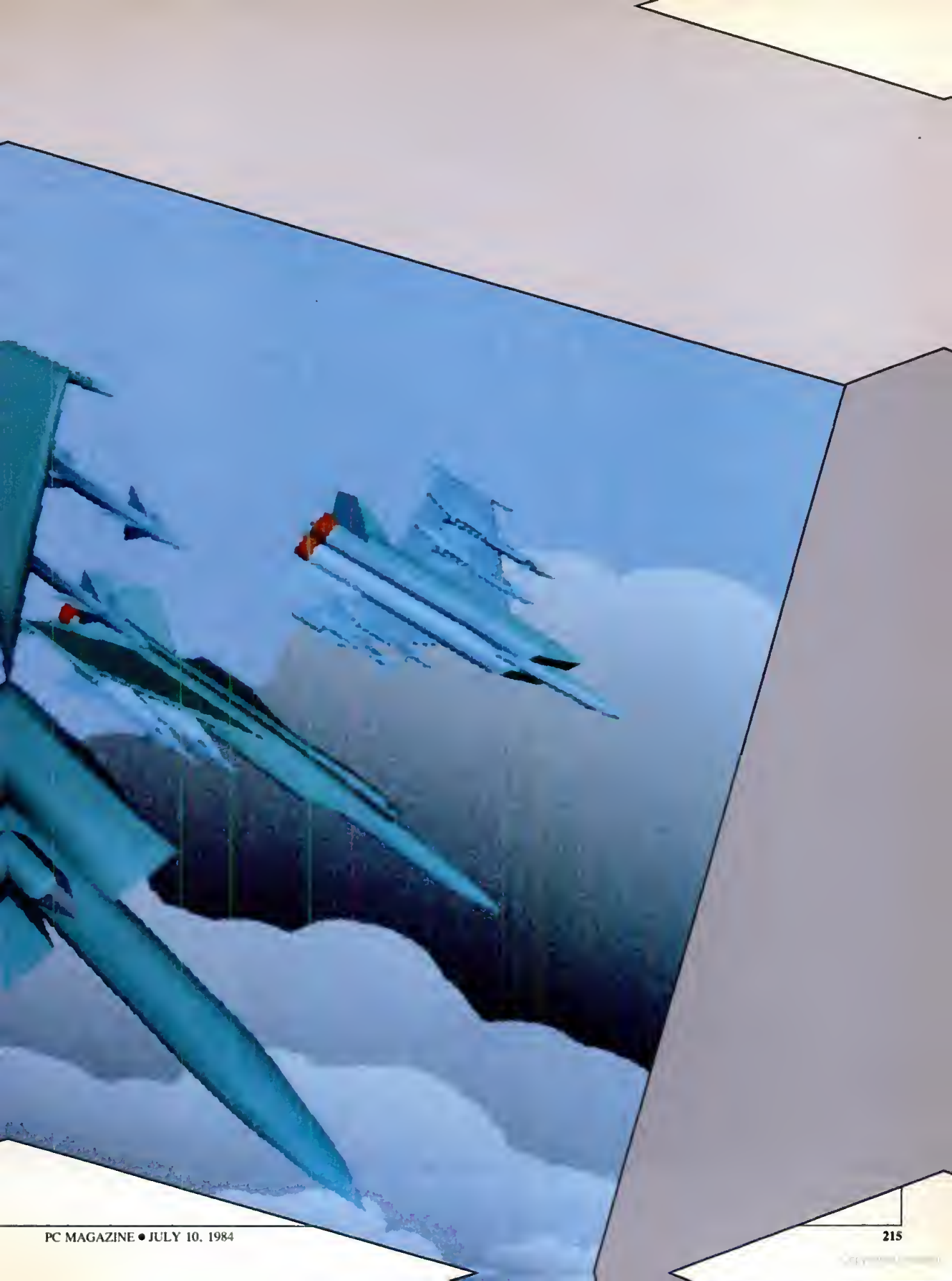
Cubicomp's CS-5 Solid Modeling System brings three-dimensional graphics to the PC at a price that puts standalone graphics systems to shame.

The bright orange satellite revolved slowly in the sky. In the background could be seen enemy Driggles in two green astrojets. Tumbling as it neared, we could see that the satellite's port doors had blown away, revealing a delicate network of landing grips. . . .

Could this be the opening to the latest space thriller? In fact, this is computer graphics at its best. Even more exciting, it's computer graphics that are available for the IBM PC at a fraction of the cost of similar systems.

In the past, graphics like these could only be created with solid modeling systems that ran on a mainframe or minicomputer and cost anywhere from $50,000 to several million dollars. Major engineering firms, architects, and animators invested a quarter of a million dollars or more in drafting programs and CAD systems. But now you can add these capabilities to your PC for as little as $10,000 with Cubicomp Corporation's CS-5, a solid modeling system that represents a breakthrough in computer graphics.

(continued)



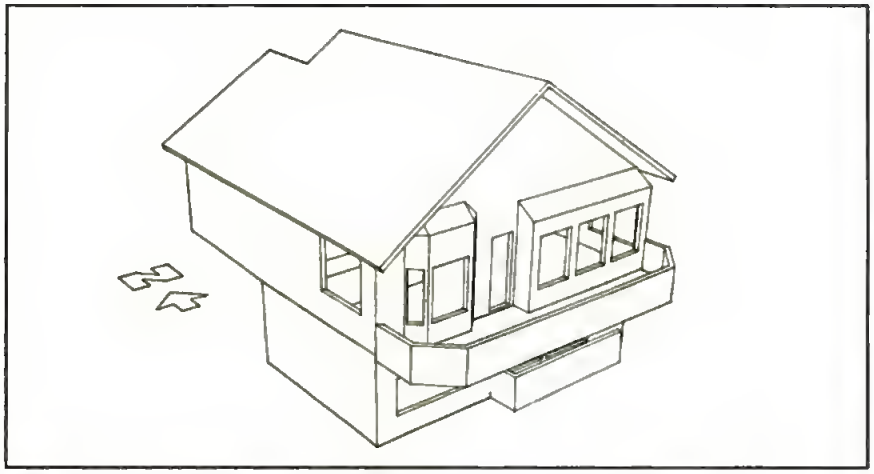


Figure 1: *A three-dimensional model built using interactive menu commands.*

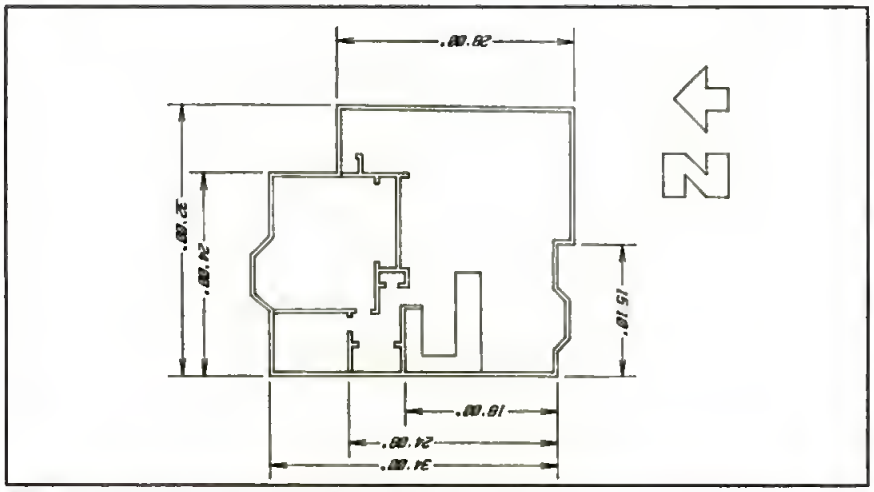


Figure 2: *A floor plan generated from the model in Figure 1.*

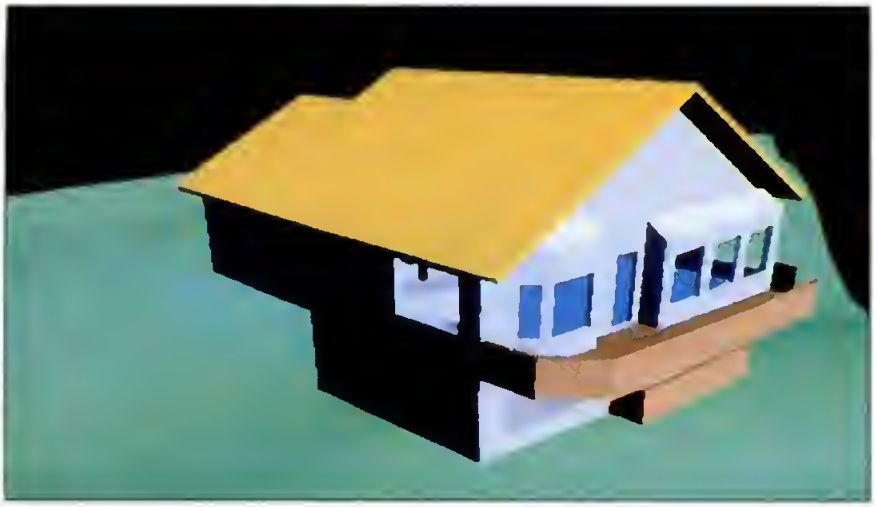


Figure 3: *How the image in Figure 1 appears when output to a color slide camera.*

Illustrations: Cubicomp Corporation

While there are a few CAD programs available for the PC, most are best suited for two-dimensional design. For some applications, such as flow charting or circuit board design, manipulation of two dimensions is adequate. But no other package offers true solid modeling.

CS-5 allows you to create three-dimensional, shaded surface models. You can build a model with CS-5 by using the PC keyboard or by moving a light pen on a graphics tablet. You can build a complex model by moving the components with respect to each other and "gluing" pieces together on the screen. You can rotate an object, choose a viewpoint, and view the object as a wireframe "skeleton" or as a solid object with shading shown from the perspective of a light source that you can position anywhere. You can store the definition of a three-dimensional object on disk and then recall it or change it. You can build a command sequence to rotate objects and move them around on the screen while you watch.

A simple cube, for example, is created by first drawing a square, using either the cursor keys on the PC or a digitizing pad. One menu command will duplicate the square, and another command causes CS-5 to draw lines connecting the two squares. This creates a wireframe view of the cube—all the lines that make up the cube are visible, including lines that would be hidden from view if this were a true solid. These "hidden lines" can be

CS-5 Solid Modeling System
Cubicomp Corporation
3165 Adeline St.
Berkeley, CA 94703
(415) 540-5733
List Price: $9,700. Accessories: *Easel-5* paint program, $2,450; 13-inch color monitor, $2,100; 19-inch color monitor, $2,600–2,900.
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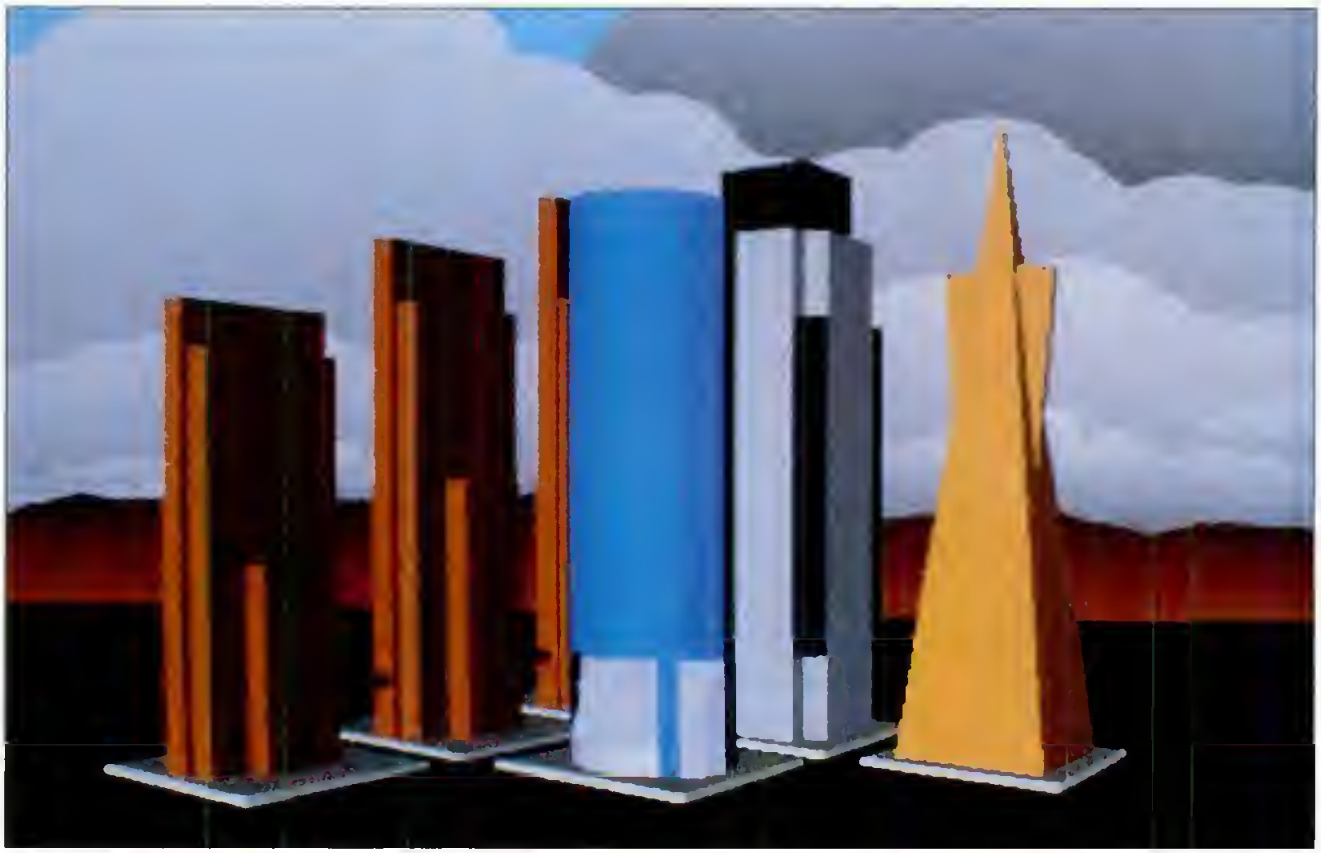

removed using a single command, and the entire surface can be colored and shaded. Cubicomp also sells a two-dimensional paint program called *Eagle-5*, which allows you to use a graphics tablet for creating the finishing touches. Backdrops such as stars or clouds can be added to any model created by CS-5, as in the illustrations shown here.

You can generate floor plans for a house from a three-dimensional picture built using interactive menu commands. A three-dimensional model of the house (see Figure 1) was created, and from that the CS-5 system generated the floor plans. A floor plan is simply a plane view or cross-section of a three-dimensional object—something CS-5 can do no matter how complex the structure (Figure 2). On the floor plans, you can use interactive entry to change the length of a wall, for example, and CS-5 will redraw the object using the new values. You can generate vertical plane views and figuratively "walk" through the rooms of the structure. You can "turn off" the roof and see the walls inside. The image can then be output to a variety of devices, including a color-slide camera (Figure 3).

Architects who have been using standard pen-and-ruler methods find that they can produce several design versions in a fraction of the time with CS-5.

Graphic boiler plates can be created. You can store a generic file called WINDOW, for example, and call it in when you are building a wall with windows. This feature saves a tremendous amount of time and eliminates the tedium of repeatedly drawing the same image.

What's even more amazing is the speed with which the system paints images on the screen. With CS-5 running on an IBM PC, graphics that take most other CAD systems from 5 to 15 minutes can be produced in 3 minutes or less.

How Dramatic a Breakthrough?

At the core of this system is 3,000 lines of C code, which Cubicomp protects as a trade secret. The system was designed by Edwin Berlin, Jr., Cubicomp's president and chairman of the board. Further contributions to CS-5's capabilities have been made by Stephen Crane, Cubicomp's director of software development. "What

we've really done here is developed our own method of hidden surface removal that is simply much more efficient than anything anyone else is doing," says Berlin. "Not even the universities have this one. We can provide faster rendering of images on an IBM PC than similar systems can do on larger processors."

The relatively low cost of CS-5 has made it appealing to both ends of the graphics industry. Small design firms and architects who have been using standard pen-and-ruler methods find that they can produce several design versions in a fraction of the time with CS-5 on a PC. Clients can see clearly what the finished product would look like, and the designs can be modified easily without having to redraw them from scratch.

Some commercial graphics and animation houses are using CS-5 to produce animated video for television advertisements. Rotating logos and other animated effects are easily accomplished with the system. CS-5 can generate a series of images based on your stored commands to rotate and move objects on the screen. Less than ten short command lines caused our orange satellite to rotate toward us, growing larger as it moved from the top left corner of the screen to the lower right, then smaller as it moved away again. To film a series of movements, CS-5 can automatically step the camera shutter and advance the film one frame after another. In fact, CS-5 is able to build simple images so quickly that they can be output directly to a video camera.

Many firms who are already using larger CAD systems find that their host processor slows down after they add five or six workstations. On a $200,000 system,

Serendipity with CS-5

A commerical artist welcomes CS-5 into his studio and discovers that the system has quite an imagination.

DaVinci would have loved CS-5. Cubicomp's CS-5 is an add-on that makes a PC into a very powerful graphics machine. It performs solid modeling, allows you to manipulate those solids in their "world" and in relation to each other, and provides a very powerful paint system to use with solid models or by itself for two-dimensional graphics of a high order.

At The Launching Pad, my commercial graphics studio, we've been using low-resolution color-graphics systems built around the IBM PC. Since the time we began assembling these systems, and through the installation of in-house computer graphics extensions, we have been engaged in a long hard search for our next step up the graphics ladder.

I selected CS-5 as an amazingly affordable powerhouse of graphics capacities that rival the computer graphics mainframes of not so long ago and putting some of the "pricey" standalone and terminal systems (electronic dinosaurs, I call them) to shame.

In order to be a proper "host" to CS-5, I had to add some things to my PC. The system will run on 320K, but 512K is recommended. I brought my PC up to 544K with a new ROM-BIOS kit on my motherboard. I also had to add an 8087 math chip to the motherboard to assist CS-5 in floating-point manipulation of the many calculations needed to create, describe, and move solids in space and in relation to themselves. CS-5 comes with a host card, which takes up one slot, and cables for CS-5 and the RGB monitor.

The permutations of graphics that are possible are tremendous. The CS-5 "black box" (it's the color, size, and shape of the IBM PC system box, but without the disk drives) allows an artist to manipulate a selection of 4,096 colors on screen from a "pallette" of over 16.7 million colors. While the screen images you work with are 512 × 512 pixels, the solid image files are 4,096 × 4,096 and can be output in that super resolution to film or a printer.

Practical possibilities include solid models for package design, medical visualizing, architectural rendering, product design, archeology, and industrial and interior design. Animation of all the above is practical on videotape, laserdisc, slide show fade and dissolve to create "clunker" animation, TV storyboard "animatics," and industrial and trade shows. An artist can even create products that do not yet exist.

I must say that despite the fact that I consider myself one hell of a designer, with Cubicomp's CS-5 I have come up with graphics I wouldn't have thought of in a million years.

For example, while working and polishing a client's graphics at home on my PC, I did a parallel development of the logo as a solid model on CS-5. My idea was to develop a mouse-eyed view of the client's logo. What happened, though, was that I spun the model so I had a fantastic eagle's view instead. I took slides of both views to my client, who thought the new "accidental" perspective was perfect.

I'm looking forward to more serendipity and tripping the light fantastic with my CS-5 system—**Barry Waldman**

extra workstations may cost $50,000 to $100,000 each. Now they can add as many PC/CS-5 systems as they need without impairing host mainframe performance, and at less than $20,000 for each workstation. With this configuration, several designers can work on different subassemblies of one project and then send it back to the large computer to put the whole assembly together, or perhaps to do some kind of analysis (thermal, stress, plastic deformation, or the like) on it. All that's necessary is that the database format of the host be compatible with CS-5.

A single image can display as many as 4,096 colors and shades simultaneously from a selection of 16 million possible colors.

The System

The CS-5 system consists of software and peripheral hardware. A standard CS-5 configuration includes the CS-5 graphics module, the CS-5 interface adapter card (a separate board that plugs into the IBM PC bus), and a high-resolution RGB color monitor with long persistence phosphors. This basic setup runs on an IBM PC (or compatible system) with an 8087 numeric processor chip. A minimum of 320K RAM and the IBM monochrome display adapter or color/graphics board are also required.

The graphics module is a separate enclosure containing 1 megabyte of graphics memory, a 4K by 24-bit color map, video display circuitry, and a separate power supply. This frame buffer can store two separate 512 × 512 pixel images at once, each composed of up to 2,000 polygons. Each 16-bit pixel uses 4 bits for overlays (menu, cursor, text) plus 12 bits to specify color. A single image can display as many as 4,096 colors and shades simultaneously from a selection of 16 million possible colors.

Cubicomp markets, but does not manufacture, a very high-resolution color monitor to accompany the CS-5 system. The system is, however, compatible with any color monitor.

Images may be stored on floppy disks or output to a dot matrix printer, pen plotter, ink jet printer, video tape controller, or camera. The command set that defines an image can be transmitted over phone lines in ASCII format, and images can be exchanged with larger host processors over a standard serial line.

The Software

The solid modeling software operates in two modes: the command mode and interactive mode. The command mode is used to specify points as explicit *xyz* coordinates, polygons as lists of connected points, colors as combinations of RGB values, and other system parameters as commonly used by larger systems. It is also used to store and recall images and databases on disk and to define blocks of commands to be executed as macros. All CS-5 commands may be called from high-level languages that run on the PC, such as C and BASIC. The commands might include those that cause the image to rotate on some chosen axis. This produces the effect of animation.

The interactive mode is an extremely easy to use, menu-driven system that permits the user to draw polygons using the numeric pad, digitizing tablet, or other input device, to assemble polygons into three-dimensional objects and to modify, manipulate, store, and display the polygons in a variety of ways. This mode is particularly helpful for new users, enabling them to master the system in a short period of time.

With the help of Cubicomp's CS-5 system, the IBM PC will be on the forefront of the computer graphics revolution in which sophisticated yet inexpensive technologies are making complex graphics and modeling more accessible. Large corporations, small design firms, and the wildly growing video industry will benefit the most from the innovations offered by CS-5 at, finally, a price that more businesses than ever can afford. ■

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- ☐ 28 Other (please be specific)

5. Do you have any *MAINFRAME* computers or *MINICOMPUTERS* on site at this location?

☐ Yes (If yes, please report accurately below for the two largest)
☐ No

Manufacturer	Model	Quantity

IBM or Compatible Personal (Micro) Computer information for this location:

(Please report accurately for each model indicated)

Manufacturer's Name, Model	6. Currently Owned (Quantity)	7. Plan To Purchase Within 0-12 Months (Quantity)	13-24 Months (Quantity)	25-36 Months (Quantity)
IBM PC				
IBM PC XT				
IBM XT/370				
IBM PC/3270				
IBM PCjr				
IBM Compatibles (Compaq, Eagle, etc.)				
Other (Not IBM or Compatibles)				

7a. In which of the following ways are you yourself involved with the *Personal (Micro) Computers* at your location?

- ☐ A Use them
- ☐ B. Recommend them
- ☐ C. Establish specifications
- ☐ D Approve purchase
- ☐ E. Acquire them
- ☐ F. Other involvement (specify) _____
- ☐ G. No involvement

8. The *Personal (Micro) Computers* purchased for this location would be:

- ☐ 1. For internal use
- ☐ 2. For resale
- ☐ 3. Other (please specify) _____

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8a. How are Personal (Micro) Computers normally obtained for this location?

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- ☐ C. Distributor
- ☐ D. Retail computer store
- ☐ E. System house
- ☐ F. In-house (company) store
- ☐ Z. Other (please specify) _____

9. Please indicate below the communications capability for which these *Personal (Micro) Computers* are used.

- ☐ A. Communicate with remote timesharing or database
- ☐ B. Communicate with internal mainframe or minicomputer
- ☐ C. Used in local area network
- ☐ D. Down load data from mainframe or remote service.
- ☐ E. None of the above

9a. Please indicate below the applications for which these *Personal (Micro) Computers* are used.

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  - ☐ A. Accounts Payable
  - ☐ B. Accounts Receivable
  - ☐ C. Billing & Collection
  - ☐ D. General Ledger
  - ☐ E. Inventory
  - ☐ F. Order Entry & Invoicing
  - ☐ G. Time Billing
- ☐ 2. Communications
- ☐ 3 Data Base Management
- ☐ 4 Data Input / Analysis
- ☐ 5. Education
- ☐ 6 Electronic Mail
- ☐ 7. Entertainment (Games)
- ☐ 8 Financial Planning
- ☐ 9. Graphics Design
- ☐ 10. Personal Time Management
- ☐ 11 Portfolio Management
- ☐ 12. Programming
- ☐ 13. Project Management
- ☐ 14 Process Control
- ☐ 15. Scientific or Engineering Applications
- ☐ 16 Statistical Analysis
- ☐ 17 Tax Calculation or Planning
- ☐ 18 Word Processing
- ☐ 19 Other _____

10. Do you help acquire, recommend, specify or approve any of the products or services below?

☐ Yes (If yes, please check all that apply)
☐ No

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- ☐ 2. Minicomputer
- ☐ 3. Personal (Micro)

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- ☐ 8. Graphics Printer
- ☐ 9. High Speed Printer
- ☐ 10. Color Monitor
- ☐ 11. Monochrome Displays
- ☐ 12. Modems
- ☐ 13. Hard Disk
- ☐ 14. Tape Backup System
- ☐ 15. CPU Compatibility Card
- ☐ 16. Memory Board
- ☐ 17. Communications Port
- ☐ 18. Plotters / Charting Devices
- ☐ 19. Local Area Networks

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- ☐ 21. Communications
- ☐ 22. Accounting
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Compared to buying an official IBM PC, assembling your own system can save you a significant amount of money. You may also get a great deal of satisfaction from customizing your own system. And you'll almost certainly learn more about your equipment by choosing your own components and boards.

On the other hand, it's not always easy to ensure that a system built out of various brands of equipment will work. Documentation for many vendors' parts is far below IBM's standard. And if you put a dollar value on the time you spend on the project, it may not turn out to be a bargain after all.

One way to build a custom system is to start with a minimally configured PC or XT and add cards to meet your needs. If you have the essential IBM components, you're guaranteed a certain level of compatibility. However, I looked at the alternative—building a system around some of the half-dozen other brands of PC-workalike main circuit boards.

I looked closely at four PC-like systems: Display Telecommunication's MegaBoard, Electro Design's IMP-12, Micromint's MPX-16, and Super Computer's Super PC.

The Display Telecommunication (DTC) MegaBoard is XT compatible. Faraday's FE 6400 and Super Computer's Super PC are meant as direct replacements for the PC 2 main system board (the version that supports up to 256K of memory using 64K RAM chips). Electro Design puts its CPU on a card, leaving the motherboard as merely a bus. Micromint's MPX-16 aims for functional compatibility rather than drop-in equivalence.

Three of the four firms actively solicit single-unit orders from individuals and small companies. Faraday Electronics, on the other hand, currently attempts to limit its sales to OEM (original equipment manufacturer) accounts. I had to test the Faraday board packaged as a starter system from TAVA.

Two other firms making PC-compatible motherboards declined to be included in this article. Netronics, which advertises that you can build its PC-workalike kit for only a few hundred dollars, claimed that it has decided not to market its board anymore. Computer Systems, Inc., reported

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that it would not be able to have its boards ready in time.

It was, of course, impossible to test the motherboards I did have with every possible PC-compatible add-on board. I chose boards that you might typically use for a custom system and are representative of PC add-on boards in general. Two of the cards are themselves mothercards that permit you to attach smaller cards onto them.

I used hardware such as display adapters from Paradise Systems and Plantronics, floppy disk controllers from Maynard and LNW, hard disk controllers from Maynard and Quadram, multifunction boards from AST and Quadram, and a Key Tronics KB 5151 keyboard. I also tested the motherboards with software such as: Microsoft's *Flight Simulator*, Lotus' *1-2-3*, MicroPro's *WordStar*, and IBM's PC-DOS 1.1 and 2.1

DTC MegaBoard

Display Telecommunications is a year-old company; the MegaBoard is its first major product. Like most of the companies building PC-equivalent motherboards (as well as IBM itself), DTC does the design, quality control and marketing while farming out the actual construction of the boards.

I looked at a fully assembled and tested MegaBoard, but you can also buy only the bare board or the bare board and a full kit of parts (See "Cloning Your Own PC" in this issue). DTC actively solicits both OEM and individual business. So far, the best way to buy the board is directly from the company.

The MegaBoard, DTC claims, is completely compatible with the PC-XT and includes the special wiring on slot 8 that many other compatible manufacturers leave out. (For those who haven't been poring over the XT schematics, DTC is referring to the additional buffer chips and slightly different wiring on one of the XT's plug-in sockets.) Some people predict that this slot will be used for future coprocessor boards for the XT.

The MegaBoard also adds a small wire-wrap area and a hard-wired reset switch. You can install perhaps half-a-dozen 16-pin integrated circuits and two 40-pin chips in the wire-wrap area—enough components to allow industrial companies to customize the MegaBoard for their products or for minor experimentation.

The hard-wired reset switch is particularly useful if you are developing software

> It's not always easy to ensure that a system built out of various brands of equipment will work.

or running programs that do not recognize the Ctrl-Alt-Del key combination reset. On a standard IBM PC, if the three-fingered soft reset doesn't work, the only way to regain control from an errant program is to turn the power off, wait for the circuits to discharge, and then power the system back up again. The MegaBoard reset switch is a much smoother solution, and it should be less strain on the components as well. Unfortunately, you might have to drill a special hole in your case for it or wire an external switch in parallel—most IBM lookalike cases don't have an opening at the right spot.

The MegaBoard I tested had 51 integrated circuits, most of them identical to those on the PC. The board has room for 256K of parity-checked dynamic memory (with jumpers to change to a full megabyte using 256K-bit RAM chips when they become available). Five other sockets can hold either ROM or static RAM chips. The standard model carries only one ROM, the MegaBIOS.

The overall quality of the board I looked at was good. The layout was clean, trace edges were sharp, and all plated-through-holes were even. It had, however, a few ripples and pits in the solder coating of the heavy power traces, as well as a few unimportant cosmetic defects in the solder-mask coating.

The manual for the board is more than fifty 8½-by-11 spiral-bound pages. It has an extensive theory-of-operation section, a few pages of assembly instructions for kits, an application section, and complete schematics. It has a table of contents, but no index. Switch-setting information is unfortunately scattered throughout the text rather than pulled together in an identifiable block.

In what I can only interpret as an invitation to copyright violation, Appendix C of the MegaBoard manual carries complete instructions on how to download the contents of ROM chips and make copies. Ostensibly, this information is given in case you want to patch your MegaBIOS, but when the procedure tells you where to find the four ROMs containing BASIC that the MegaBoard does not have, it becomes obvious that the company is suggesting you might want to try it with IBM's XT. This suggestion is, in my opinion, out of place.

I found the DTC people competent and pleasant in my dealings with them. MegaBoards were in limited supply when I first called, and they were honest about the expected delays.

Mega Operation

After first double-checking the power connector pinouts, I connected the MegaBoard and made sure nothing smoked when I fired it up. I then plugged in the Paradise Systems MultiDisplay Card, the Maynard disk adapter, and two Shugart disk drives. DOS Version 2.1 booted right up. So did Version 1.1, *WordStar*, *Flight Simulator*, and Lotus' *1-2-3*.

Next, I added the Quaddisk controller, with its Syquest 6-megabyte removable hard disk. Because some hard disks can be damaged by improper operation, I broke down and looked at the manuals before turning on the power.

The instructions for the Quaddisk were quite clear, and I had no trouble figuring

out how to call the disk initialization program using DOS' DEBUG utility or how to format the disk using the FDISK and FORMAT programs. Although my "fixed" disk was removable and slightly smaller in capacity, the total combination otherwise worked just like an XT.

The MegaBoard seemed to work just as well with Maynard's floppy disk controller, LNW's BusBoard floppy controller (including its 8-inch option), and the Plantronics Colorplus video adapter board. I was less successful, however, in running the Maynard hard disk. Although I was able to initialize the disk, the DOS FORMAT program didn't like the result, nor did the ordinary read and write operations.

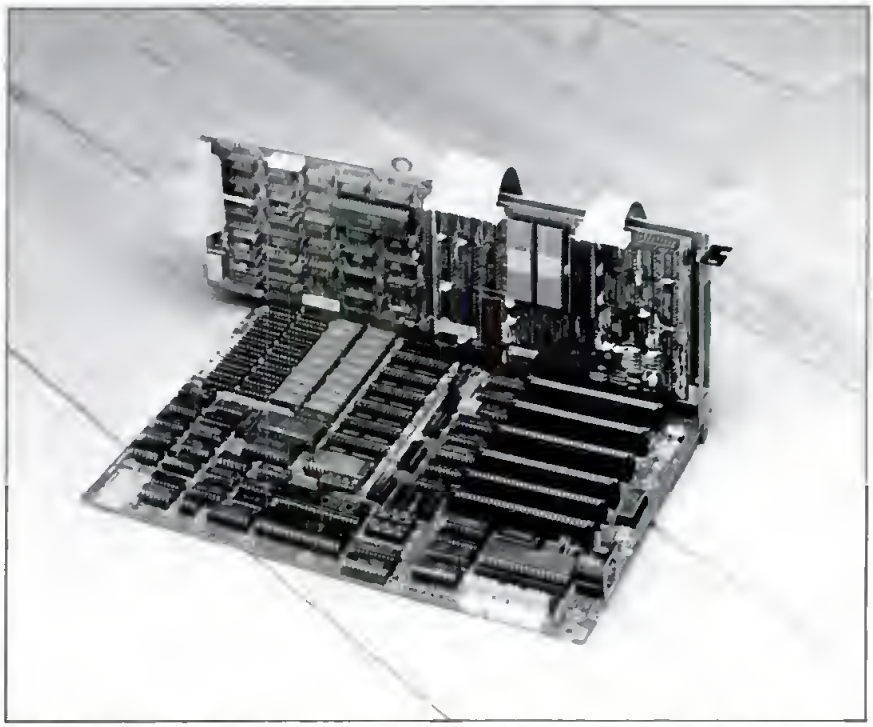
When I called Maynard, I talked to a succession of friendly people quite willing to talk about the problem—but nobody had a solution. "It must be a timing problem," they concluded from my description of the system. "Try it on a genuine PC," they told me. I later discovered it was a bug in the prerelease version.

Super Computer

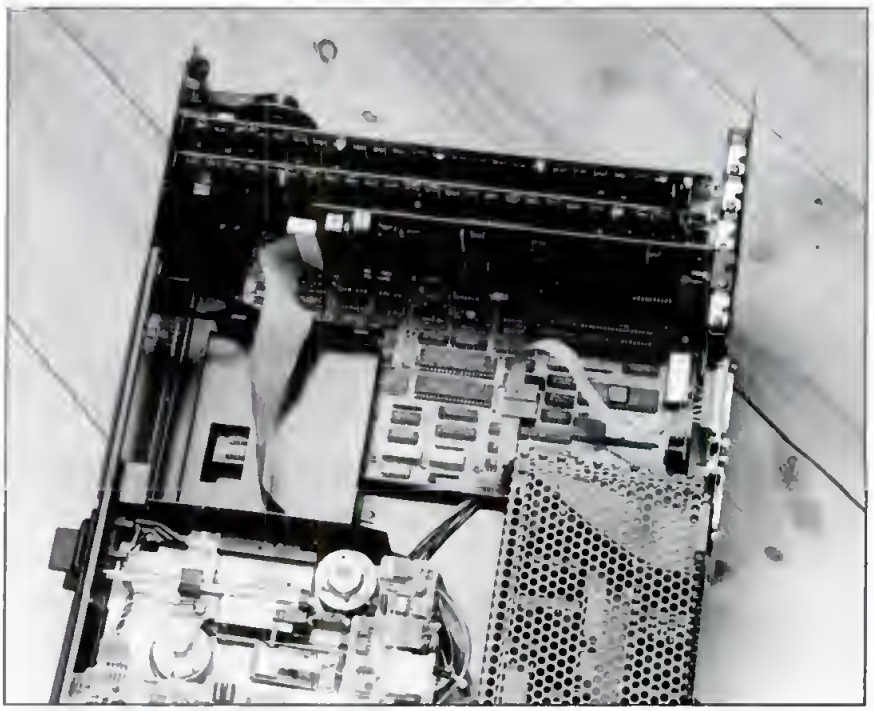
Next on my list was the Super PC from Super Computer, Inc. Prior to introducing its PC board, Super Computer had been marketing an Apple workalike that Apple Corporation took legal exception to. That problem's been all cleared up, I've since been assured. And besides, the only way small companies find out exactly where the limits are is to see at what point the big companies will chase after them.

The Super PC is a PC 2 workalike that you can buy as a board, with just the sockets soldered on, or completely assembled and tested. The firm also markets a companion Super XT board, a PC-XT workalike. Finally, Super Computer has a complete catalog of power supplies, cases, keyboards, and peripheral cards.

Super Computer also farms out its actual board production and stuffing, but the design (or adaptation, to be more precise) was its own. The board was originally sold without a BIOS ROM, but one is now



The Super Computer, Inc,'s Super PC board features plenty of room for memory and board expansion, but doesn't include disk controllers.



Faraday's PC board has been adapted for use in the inexpensive Tava PC compatible, as our reviewer discovered when he asked for the board and received the whole machine.

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available as an option.

Not counting memory chips, the Super PC board has 49 chips, space for 256K of RAM, eight ROM sockets, and five slots for adapters (plug-in boards). Apparently, you can get a model with two more adapter slots between the existing sockets if you accept extra-tight spacing.

The board quality seems generally high; the silkscreened labels that give parts locations even show jumper options for different types of ROMs. The unit I worked with had one soldered jumper on the back.

The manual is a skimpy, but adequate, dozen pages. Half of it summarizes the theory of operation (and refers you to the IBM *Technical Reference* manual for further details). The rest includes switch settings, a single page to help users troubleshoot kit units that don't work, and some assorted jumper settings. You also get a full set of schematics.

When I loaded the Super PC with adapter cards, the system would not boot up. After a look at the manual, I realized that the switch settings I got it with did not anticipate my selection of memory boards and display adapters. Resetting the switches solved the problem.

After that, the Super Computer board booted up both versions of DOS without any trouble, and did fine on all the test software. With *Flight Simulator*, the Paradise MultiDisplay worked perfectly, but the Plantronics Color-Plus board produced a significant amount of color snow on an RGB monitor.

The Quaddisk also worked perfectly on the Super PC, but again I ran into the same problem with the Maynard hard disk. As a test, I then connected the Microscience International 10-megabyte disk that came with the Maynard board to the Quaddisk controller. That worked fine, leaving me to conclude that I must have a defective Maynard controller.

Faraday and TAVA

Faraday Electronics was one of the first companies to publicly announce a PC lookalike system board. Although its initial announcements went to both industrial and consumer magazines, the company decided to concentrate on sales to firms that would repackage its board rather than to end users.

The Faraday FE 6400, which OEM customers can buy for less than $300 in large volume, forms the heart of many PC compatibles. With thousands of units out in the field and close to 2 years' experience, the Faraday unit is now almost perfectly compatible with the PC.

The IMP from Electro Design was the only machine I tested in which the CPU wasn't on the motherboard.

The major design changes that Faraday made in its system board were the omission of the cassette port (dropped by IBM on the XT as well), and the addition of an on-board serial and parallel port. The FE 6410 also has an on-board disk controller that the PC lacks.

According to Chuck De Vita, Faraday's vice president, the company's decision to discourage single-unit sales was a matter of concentrating its resources to serve the OEM market, not a reluctance to see its board widely distributed. Faraday sells sample boards and complete systems for evaluation, but it would rather end-users bought boards from a company set up to provide the needed support. I did find that it sometimes took two or three calls to get through to a particular person at Faraday, but both executives and staff people were cooperative and knowledgeable.

Faraday suggests that single-unit customers buy through TAVA Corporation. The latter's TAVA PC is a Faraday board plus power supply, case, and optional keyboard, drives, and adapters.

TAVA was still getting organized to sell PCs when I contacted it and I initially encountered a great deal of confusion. It did, however, eventually ship me a unit (but with no documentation whatsoever). The same firm runs a successful mail-order and retail store, so by the time this article is published, it should have all its arrangements working more smoothly.

Fortunately for me, I had previously received a copy of the OEM manual from Faraday. Although adequate for set-up, the copy I received had no schematics or repair information.

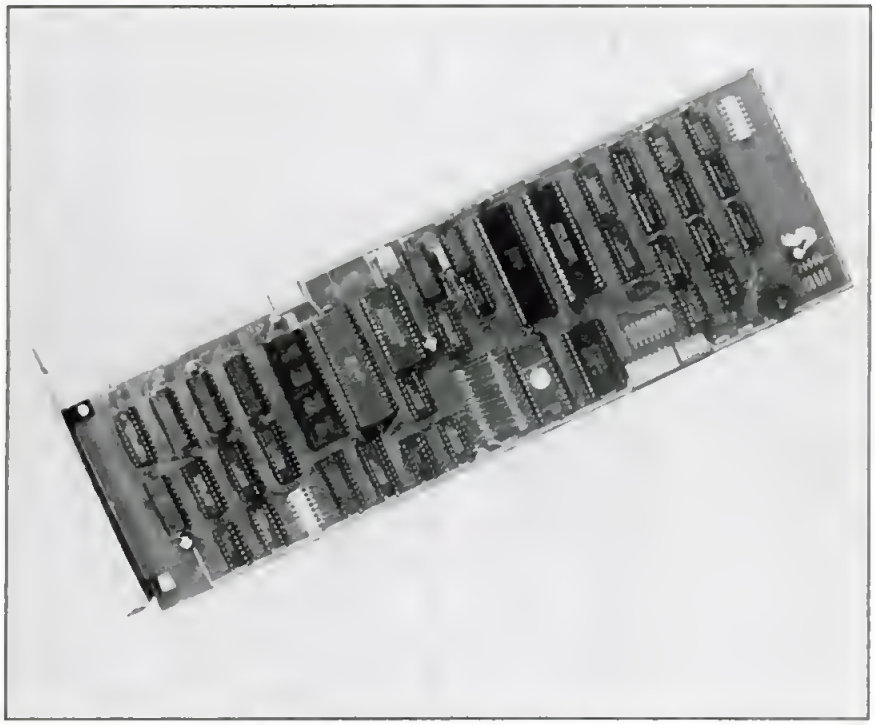
The Faraday/TAVA unit passed all my software and hardware tests. The case seemed sturdy enough, and the fan no noisier than other similar systems. I liked its use of DB-25 connectors (the standard "RS-232" style serial connector) for the serial port—it saves you from hooking up the monitor where the modem should go. Otherwise, the unit is a plain, almost generic compatible.

The Electro Design IMP

The IMP from Electro Design was the only machine I tested in which the CPU wasn't on the motherboard. Instead, this unit, comprising a box with a bus (or backplane) mounted in the back, houses the active circuitry for the CPU on a standard PC-sized plug-in card that goes into any slot on the bus. When you're ready to move up to a more powerful processor, the company points out, you'll only have to replace the CPU card instead of a complete main system board. You can also use the box without the CPU card as an expansion chassis.

At the time I got my unit, Electro Design had only designed its own CPU card, and was using disk controllers and video adapters from outside firms. By the time this is published, the company should be shipping several other boards of its own design, along with a full catalog of keyboards, monitors, and other system components.

I like this system quite a bit. The chas-



Electro Design's system features 8, 12, or 18 slots and the unique design of a plug-in CPU on a card.

sis is solid, the power supply completely enclosed, and best of all, it has more slots than I need (at least for the moment—in the long run, there are never enough slots). My unit had a 12-slot bus, but you can get a 6- or 18-shot unit if you prefer. You pay industrial prices for this unit, but you get industrial quality.

I had half expected that Electro Design's nonstandard partitioning of the system by putting the CPU on a card would detract from its compatibility, but that doesn't seem to have been the case. The IMP system successfully ran with all my test add-on boards and with all the test software.

One small side-effect of the CPU-on-a-card design did end up to be a bother—because the speaker is soldered directly to the CPU board, you can't easily install an on-off switch. I find being able to turn off the sound when I want to a psychological necessity, so for now I've temporarily sealed the speaker with tape.

Like the Faraday, the Electro Design unit I received must have been an early one: It came with no documentation on the CPU board or chassis. Documentation including schematics, should be available by the time you read this, according to the company. Otherwise, I found the firm helpful and responsive.

Micromint

The MPX-16 was originally featured as a "Ciarcia's Circuit Cellar" project in *Byte Magazine*, and is now sold by Micromint. You can buy it as a bare board, socketed and soldered, or assembled. Micromint will also sell you a complete PC-compatible unit based on the board.

At the time the MPX-16 was designed, the battle between CP/M-86 and PC-DOS had not been decided, and Ciarcia and his codesigners bet on CP/M-86. Through later changes to the ROM, it has been made quite compatible with MS-DOS, and mostly compatible with PC-DOS as well.

According to Micromint, the unit is completely bus compatible with the IBM PC, although it does have some internal differences. The main board includes a CPU and the bus connectors, plus a floppy-disk controller (for both 5½ and 8-inch disks), two serial ports, and three parallel ports.

For PC compatibility, the MPX-16 needs a special adapter card with the keyboard interface and speaker, plus a standard PC display adapter. You get nine adapter slots, but as they're spaced on half-inch centers, you'll probably be able to use only five of them.

The MPX-16 manual consists of more than 100 pages in a custom-printed 8½-by-11 binder. You get a User's Manual, an Installation Guide, and a Technical Reference section, although all are oriented toward the more expert reader. Unfortunately, the manual, at least in the revision I received, assumes that you'll be running CP/M-86 or programs burned into ROM. MS-DOS and PC-DOS were not even mentioned. Similarly, the manual noticeably lacked a discussion of how to integrate add-on boards into the system.

In my tests, PC-DOS 1.1 and 2.1 booted right up. Several of my hardware test boards would not fit into the slots in the MPX-16 board, so I was unable to try to expand the memory beyond the 256K on board. The MultiDisplay card worked fine, but with the ColorPlus card installed the system wouldn't respond to the keyboard.

I was able to run *WordStar* and *1-2-3* without trouble, but *Flight Simulator* got no further than the initial screen asking what type of monitor I was using.

I had some initial difficulty reaching the right people at Micromint, and then prodding them into action. But once I did so, they were quick to answer queries and helpful.

Boards from Scratch

If choosing your own motherboard and adapters still doesn't give you all the flexibility you need, two of the products I looked at let you customize single plug-in

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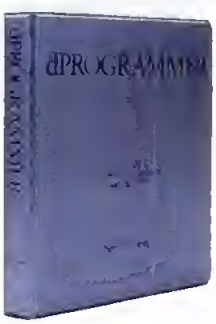

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multifunction boards for your PC. LNW's Busboard series includes a full-sized mothercard that serves as a memory expansion card, onto which you can plug a disk controller, timer, analog-digital input, modem, and a bunch of other functions.

The similar, but noncompatible Sandstar series from Maynard starts with a floppy-disk controller or an empty mothercard, into which you can plug from three to six memory modules, a serial or parallel port, a clock calendar, SASI interface or complete hard-disk controller.

Both units save slots only by extending the thickness of the mothercard. If you're building your own system and can find an oversized case, this method can be a decided advantage.

The Sandstar with a plug-on module is a full inch wide, the Busboard even wider (and the Busboard will carry plug-ons on both sides if you have the room). The PC-style motherboards only provide an inch between slots and the XT-style is ¾ inch—barely enough room for SandStar and not enough for the Busboard unless it's in the end slot.

Assembling your own system can be quick and easy, but it can also be an expensive, drawn-out struggle. Compared to silicon, copper and plastic, knowledge and experience are still expensive.

Prices for these boards vary enormously, depending on the source, the quality of support, and what quantity the seller bought.

If you don't know an address line from an AUTOEXEC file or a DB-25 from a DIP; you're better off with a packaged solution. Of all the pieces I looked at, none had documentation adequate to tell a beginner how to integrate it into a multiboard system.

Even for an expert, putting together a collection of dissimilar boards can be a hassle. Every board I looked at had a different power connector, for example, and several had their keyboard connectors in unique locations—I must have made up a dozen different cables. Some of the standard cables wouldn't fit on these connectors because the cable hoods hit the chassis, requiring still more rework.

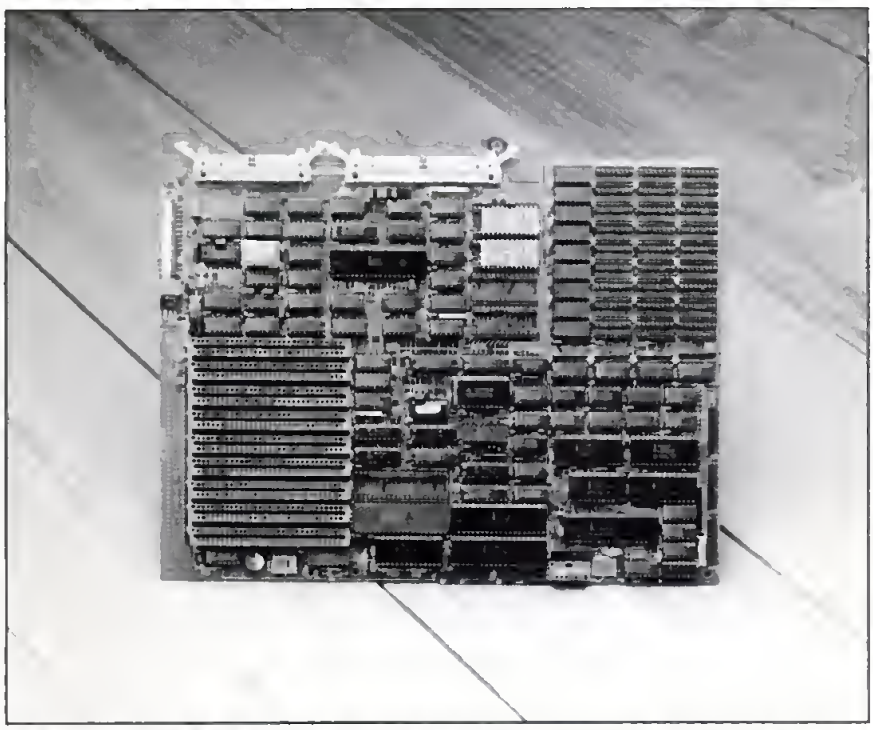
What's the Problem

If a board doesn't work, you won't be able to figure out if it's a compatibility problem or a defect unless you have access to another system. It takes a good friend or a tolerant coworker to let you put a board that you suspect is malfunctioning into his or her hitherto working system. For that reason, you might be better off buying your first system and building a custom system the second time around.

Furthermore, of all these units, only the MPX-16 was designed as a standalone board—and in that mode it's not PC compatible. To make a functioning PC-like system with any of these boards, you'll need to add at least a power supply, disk drives, video adapter and disk controller, and you'll probably want some sort of case.

Several of the companies that sell main system boards will gladly sell you everything else you need to make up a system. If you're buying in large quantities, you might even get an attractive packager price.

If you're not buying everything from a single source, there are no guarantees that it will all work together. Remember that two boards compatible with the IBM PC are not guaranteed to be compatible with each other. Make sure before you buy that you can return the purchase if you can't make it work in your system. You won't be able to return a kit, of course, but you



Micromint's MPX-16 can function as a standalone board, but you must give up that freedom to achieve PC compatibility.

Picking Up the Pieces

Prices, compatibility, and pieces included vary a great deal among these motherboards and other PC clone components. If you shop carefully, however, you may save some money.

MegaBoard
Display Telecommunication Corporation
4100 Spring Valley Rd. #400
Dallas, TX 75232
(214) 991-1644
List Price: Assembled and tested, $599.95; kit, $249.95; bare board, $99.95

CIRCLE 682 ON READER SERVICE CARD

IMP PC
Electro Design, Inc.
690 Rancheros Dr.
San Marcos, CA 92069
(619) 471-0680
List Price: $450 to $789 per unit, depending on quantity. (includes CPU-88, 230-475, IMP-12 chassis).

CIRCLE 683 ON READER SERVICE CARD

Busboard
LNW Computers
2620 Walnut
Tustin, CA 92680
(714) 544-5760
List Price: Busboard, $349.95; plug-ons, $29.95 to $249.95

CIRCLE 684 ON READER SERVICE CARD

Sanstar Series
Maynard Electronics
400 East Semoran Blvd., Suite 207
Casselberry, FL 32707
(303) 331-6402
List Price: Mothercard with controller and hard disk, $1,395 to $1,595

CIRCLE 685 ON READER SERVICE CARD

MPX-16 Computer
Micromint, Inc.
25 Terrace Dr.
Vernon, CT 06066
(203) 871-6170
List Price: Bare board with BIOS EPROM, manual, and keyboard adapter, $400; complete system, $2,400

CIRCLE 686 ON READER SERVICE CARD

MultiDisplay Adapter
Paradise Systems, Inc.
150 North Hill Dr.
Brisbane, CA 94005
List Price: $595

CIRCLE 687 ON READER SERVICE CARD

QuadDisk
QuadBoard
Quadram Corporation
4355 International Blvd.
Norcross, GA 30093
(404) 923-6666
List Price: QuadDisk, $1,995 to $6,500, depending on capacity; QuadBoard, $295 to $795

CIRCLE 688 ON READER SERVICE CARD

Super PC
Super XT
Super Computer, Inc.
1101 S. Grand Ave., Suite J
Santa Ana, CA 92705
(714) 543-2927
List Price: Bare board, $95; BIOS ROM, $35; assembled and tested board, $560.

CIRCLE 689 ON READER SERVICE CARD

TAVA PC
(a Faraday board)
Tava Corporation
16861 Armstrong
Irvine, CA 92714
(714) 261-0200
List Price: $1,295 for board, case and power supply.

CIRCLE 690 ON READER SERVICE CARD

should be able to exchange a video card or a disk controller.

If you're trying to save money on an ordinary PC by assembling it yourself, you might also note that IBM chose to use standard parts for many of the subsystems. You could do the same. Several surplus houses now feature power supplies, disk drives, cases, cables and other parts you need to go from system board to complete system.

Finally, check out the latest ads before you buy. Prices for these boards vary enormously, depending on the source, the quality of support, and what quantity the seller bought. You'll probably also notice at least a half-dozen more motherboards advertised than I was able to get to this time around. Some of these are recent releases, some just escaped my notice, and some are advertised and even photographed but not yet debugged or delivered. A sad truth in this industry is that not every ad represents a deliverable product.

If you don't enjoy working out puzzles, you can afford to pay full price, or you need a working system in a hurry, buy a complete package. But if you like the challenge, want it built your way, or need to recycle a few power supplies and disk drives to cut costs, go the custom route. You'll end up with a better system and a real education in compatibility. ■

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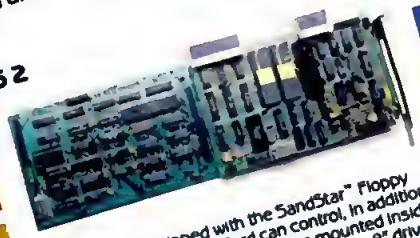
WS 1

This System is equipped with the SandStar™ Multi-function card. In addition to the Hard Disc Controller Module, you can add up to three other SandStar™ Modules while using only one card slot. The following modules are available: Serial Port, Parallel Port, Clock Calendar, Game Adaptor, and Prototyping Module

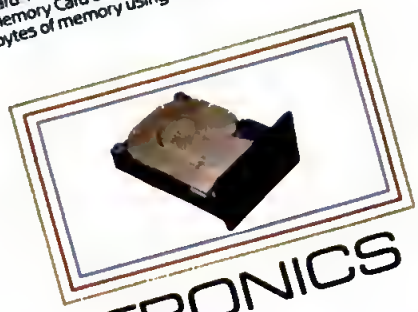
WS 2



This System is equipped with the SandStar™ Floppy Drive Controller Card. The Card can control, in addition to the Hard Disc Drive, two floppy drives mounted inside your PC and optionally two additional 5¼" or 8" drives mounted externally. This leaves three system slots for other expansion boards.

WS 3

This System is equipped with the SandStar™ Memory Card. In addition to controlling the Hard Disc Drive, the Memory Card allows you to add 64K bytes to 576K bytes of memory using only one card slot.



To expand your PC to perform like the PC XT, one of our Winchester Hard Disc Drive Systems is right for you. And if you have already made the wise decision to install any of Maynard's SandStar™ Cards, the SandStar™ Hard Disc Controller Module may be purchased separately.

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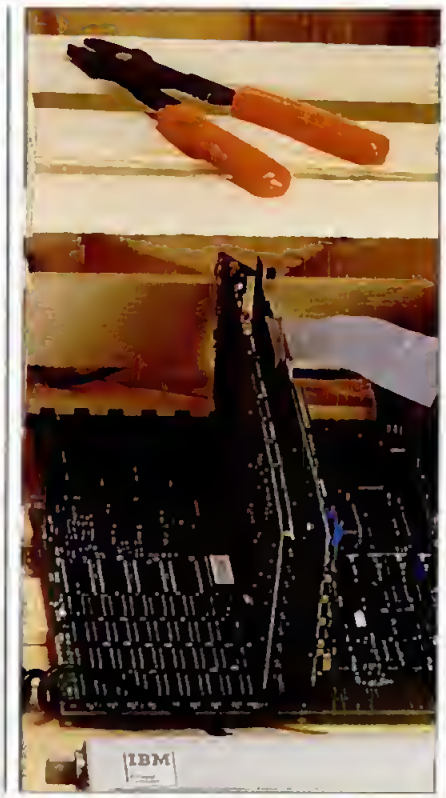
Cloning your own PC

Building your own PC compatible from the bare circuit board up may be a great way to save money on a computer and gain confidence—but not if you have no electronics know-how.

Building your own IBM-compatible personal computer is an intriguing idea. If you're like the typical American and have the do-it-yourself philosophy branded in your brain, you know the lures. Aha! you think, not only can you save lots of money, but you can learn about the computer's intimate workings, and gain new confidence in using a computer.

If you're thinking along these lines, the economics seem all too obvious: IBM does not sell its products at its cost for constituent parts. Big Blue must pay labor and overhead and make a profit. Then the dealer will add a bit to the price as well.

The magnitude of these other costs and margins may strike you forcibly if you scan the price list of a semiconductor distributor. You add up the figures. When it comes down to the bottom line, you muse, you might just save several thousand dollars over the price of the PC in your computer dealer's showroom by doing it yourself. After all, a computer is only a handful of tiny circuits soldered into place. All you need is some kind of kit, right?



Photography: Len DeLessio

A Computer Kit?

Electronic kits became popular in the 1950's when the only way most people could afford a genuine stereo system was to build the components themselves from packaged products offered by such companies as Dynaco, Eico, and Heathkit. These kits came complete with every part and electronic doodad you would need and a step-by-step list of instructions. Not only did putting the kit together save you a bundle on a first rate stereo, it also gave you confidence, pride, and an intimate knowledge of your equipment. Building the kit made you feel a part of the modern age, in command, in control—a human triumphing over technology.

In planning to build your own PC clone, you may be trying to capture that same feeling of mastery over onrushing technology. Unfortunately, you cannot simply buy a high-performance computer kit. Several companies do offer bare com-

A crate personal computer: The soul of the machine is DTC's inexpensive MegaBoard. Driven by IBM's PC power supply, the handbuilt motherboard can run any typical floppy drive. Shown here is the Master 409 from Control Data.

puter circuit boards already etched with the proper arrangement of copper traces to make personal computers. In theory, all you have to do is squeeze the other parts in the proper places and solder them in.

However, these available means of assembling your own personal computer are not the same carefully documented, fully inclusive, and guaranteed never-fail

You can't buy one big box that includes everything from transistors to dial cord to a high-impact plastic case.

Heathkits of days gone by. You can't buy one big box that includes everything from transistors to dial cord to a high-impact plastic case. Rather, you must buy the pieces—the 5-cent resistors and $40 microprocessors—to fill the empty holes on the bare board.

Nor do you have the luxury of one-stop shopping. You have to find each and every electronic component and solder it in place separately. You have to find the case to put the board in. You have to find the accessories you'll need to get it to run, like the power supply (maybe even the power cable!), the disk drive, the disk drive controller, the monitor adapter, and the keyboard. These accessories do not come cheap.

The bare circuit boards also do not come with step-by-step instructions with

MegaBoard
Display Telecommunications Corporation
4100 Spring Valley Rd., #400
Dallas, TX 75234
(214) 991-1644
List Price: $99.95; socketed, $249.95; fully assembled, $599.95.

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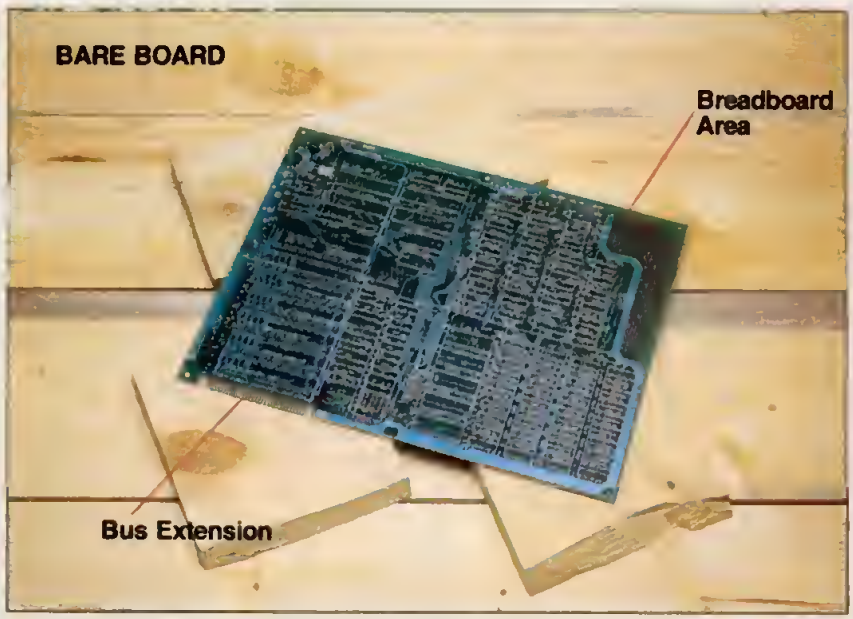
little boxes to check after each part is properly soldered in place. The manufacturers give you no lengthy explanations of how each circuit component works and why it's there, no helpful instructions on how to tin your soldering iron and make a proper connection. They give you not even the simplest clue on how to tell one part from another.

Mostly these bare boards are for those already in the know. In fact, they're generally sold to other manufacturers whose engineers know exactly what they're doing. The circuit board makers assume that you can identify artifacts like a 7-microsecond delay line and know where to get one. They assume you can translate those little rainbow stripes on resistors and alphanumeric codes emblazoned on capacitors, and that you know what a resistor and a capacitor are.

These do-it-yourself computers do work. It's true that you could save several thousand dollars in the process, but you could also waste both your time and a substantial amount of your savings. As I found out, these projects are hardly for everyone. You have to be the right sort of person, with the right sort of knowledge. If you are, building your own PC might be a perfect project for you.

The Project

Display Telecommunications of Dallas, Texas, offers one of the newest and, according to the company, most PC compatible of all personal computer bareboards, called the MegaBoard. To develop a board that would work exactly like an XT without running afoul of the copyright laws, Data Telecommunications created its own circuit board layout from scratch and a ROM circuit chip to bring it to life and load the disk operating system. The design works so much like an XT that Display Telecommunications claims to use IBM's diagnostics to burn in the MegaBoards that they stuff with parts and test themselves. (If you don't trust your own handiwork, you can buy one of these for a paltry $595.)

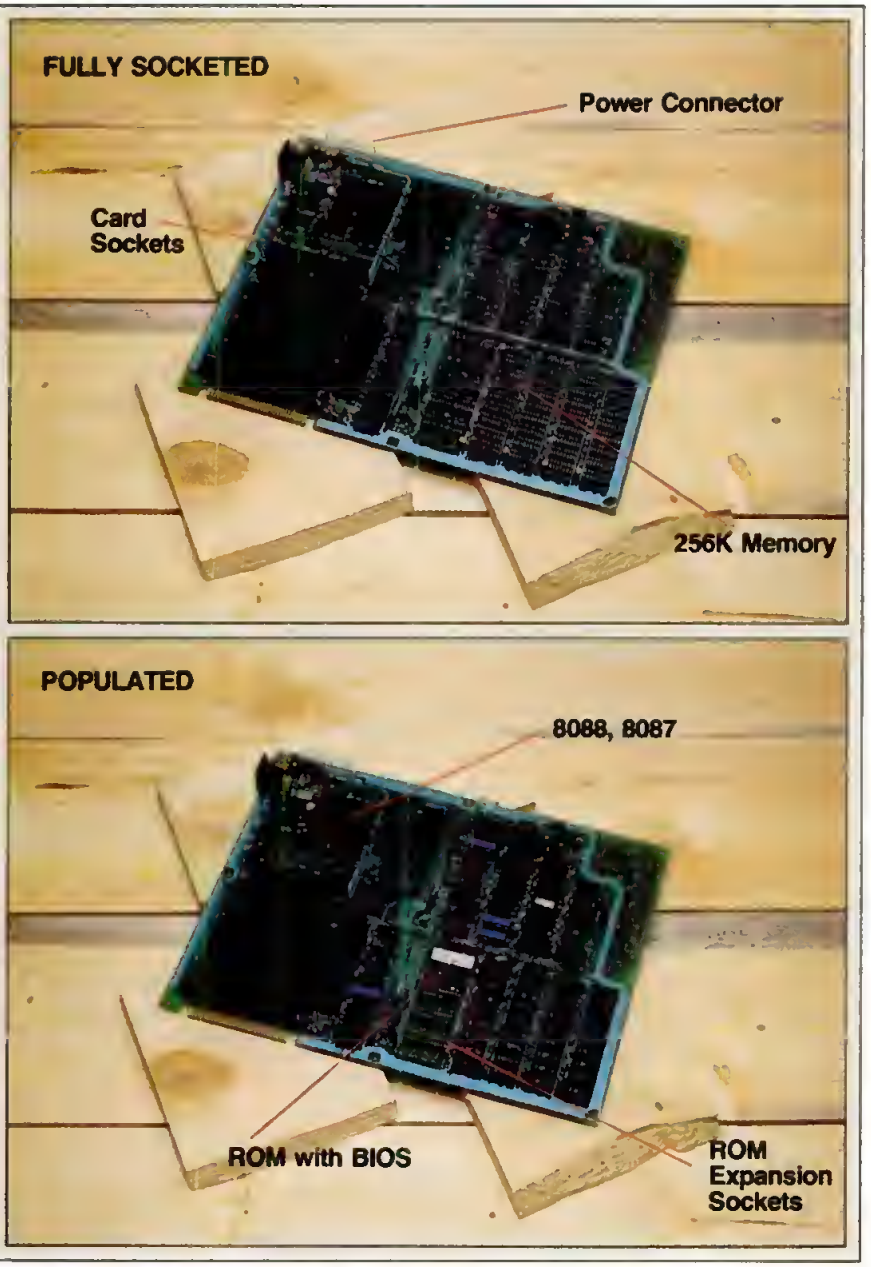


Playing The Circuit: The Challenge of Dressing a Bare Board

Creating a homemade PC begins with the $99.95 bare circuit board shown above. It is slightly larger than the PC-XT's motherboard, but supplies the same area for expansion slots and is designed for the highest possible levels of IBM compatibility. The bare board's principal market consists of companies that want to add inexpensive PC compatibility to their systems. But it is well within the scope of any PC user who isn't scared of a soldering iron. In the picture above right, the homemade board is halfway there—all integrated circuit sockets are in place. You can buy a socketed board from DTC for $249.95. Below right is a picture of the finished MegaBoard. Figuring out which chips and components to place in which sockets turned out to be the most frustrating task. A finished DTC MegaBoard costs $599.95, but the fun, learning, and savings lie in assembling your PC from scratch.—MIKE EDELHART

Anxious to learn the truth about this masterpiece of IBM imitation, I ordered a bare MegaBoard for $99.95 with the intent of building the world's cheapest PC-compatible personal computer. I had not yet learned all those hard lessons about skills and parts—I wanted to find out how well someone akin to the typical *PC* reader could assemble a functioning computer from a bare circuit board.

I disqualified myself from the task—I have a bit more experience in building things electronic than most. So, I enlisted the aid of good friend and next door neighbor John O. Schoenbeck. Though not a complete neophyte when it comes to electronics—he had assembled several Dynaco stereo components which had worked—John was sufficiently nonelectronically oriented to point out the pitfalls



a typical first-time computer builder might encounter. He was also gullible enough to assent.

The MegaBoard

When the MegaBoard finally arrived—2 days after I had phoned in the order—it proved to be a minor masterpiece of the circuit designer's art. Everyone who encountered the board was impressed by its high standards of quality and workmanship.

The layout of the circuit board itself is, in fact, far simpler than the IBM original. Unlike the IBM circuit boards which have layer upon layer of etched copper traces stacked upon one another, the MegaBoard is simply double-sided, the copper trails only on its two outer surfaces.

The simplicity of the MegaBoard's layout means lower production costs for DTC as well as a small penalty; it means that the board must be somewhat larger than a genuine XT motherboard. Notwithstanding this additional floor space, the area allowed for expansion cards on the MegaBoard is identical to that of the official XT board.

Several jumpers are required to make up for the circuit crisscrossings not possible with the simpler two-layer design. On the MegaBoard, these jumpers take the form of continuous strips that mount in three rows.

The board itself is masked, tinned, and silk-screened, with most parts locations plainly marked. If you match the designations on the board with the corresponding numbers from the parts list, putting everything in the right place is—or should be—easy.

The manual is a slim affair that concentrates on the design and inner workings of the circuitry. It's written so that you'll easily understand it, provided you're an electrical engineer with a good deal of experience in microprocessor design. The assembly instructions barely fill three pages: Solder in all the capacitors. Solder in all the sockets. Plug in the circuits.

Of course, since Display Telecommunications created the MegaBoard to sell to other manufacturers (such as AT&T), it assumes that a company's resident engineers know what the *argot* actually means.

The MegaBoard is not something to approach with the two screwdrivers you use for tuning your car, a ball-peen hammer and a woodburning set that you've turned into a soldering iron. You need good quality, precision electronic tools: pliers, side cutters and a temperature-controlled soldering pencil. The MegaBoard manual recommends that you also have on hand a wide-band 100 MHz oscilloscope (which likely would cost more than one of the computers you hope to build) for testing in case the completed computer does not work.

Before you can solder down the parts,

CIRCLE 808 ON READER SERVICE CARD

however, you must first get them. Display Telecommunications supplies a parts list and recommends buying the necessary parts from the mail order electronics suppliers that advertise in the classified sections of magazines such as *Computers and Electronics*.

If you intend to build a minimum-cost computer, comparison shopping for parts is critical. The big savings in building the computer yourself come from buying your parts from the cheapest suppliers. Prices vary more than you might expect. Many mail-order suppliers sell microprocessors and their kin at rates less than you—or even Display Telecommunications—can buy them elsewhere. Of course, finding some of the more esoteric parts can be challenging.

For our project, I tried locally first. My local purveyor of inexpensive electronics, Electronic Surplus, Inc., was happy to supply the more common parts, such as sockets for each of the integrated circuit chips (unlike the IBM original, the MegaBoard uses a socket for each chip). I also bought their garden-variety capacitors, resistors, and the 7400-series TTL integrated circuits—all at prices that made manufacturers' list look laughable. Unfortunately, Electronic Surplus didn't have the more powerful chips and more exotic circuit fauna in stock, and buying from official distributors would have entailed a lengthy wait and paying the manufacturers' fanciful list prices.

I turned next to mail order. Buying the larger, more expensive chips by mail is relatively quick and painless—just look at the prices in the most recent magazine ad and mail off your check. But don't expect any single supplier to scan down a photocopy of the parts list from the MegaBoard manual and whisk you everything that you need. You may have trouble obtaining some things by mail order. These may include the connectors you'll need if you plan on using standard PC-sized expansion cards. Other challenges might be the two delay lines needed to bring the board to life, the trimmer capacitor for the sys-

tem clock, several other connectors, and a couple of the integrated circuits. Fortunately, Display Telecommunications will sell you the hard-to-find parts, but at prices near list. Even at those rates, the total cost for the impossible-to-find segment should amount to less than $75.

> Don't forget to properly ground yourself and your work lest an errant bolt of static electricity wipe out several hundred dollars worth of integrated circuitry.

Search and Solder

The actual work, which John did, involved soldering down everything on the board. Each integrated circuit socket needed from eight to 40 separate solder joints, in total, several thousand solder connections on the MegaBoard. By Display Telecommunications' estimate, assembling the board requires about 8 hours of soldering. John, perhaps because of his incomplete electronics background and quest for perfection in the end product, spent roughly twice that amount of time. He figured he'd rather take lots of time being extra careful in putting the board together than spend interminable hours trying to find a microscopic defect that was preventing the finished board from working. His attitude is the proper one.

Soldering is genuine busy work; there's absolutely no intellectual effort involved in shoving 16 little pins into 16 matching holes and melting solder around each one. For some, it can be relaxing, but for others, endlessly frustrating.

If you want to avoid both brain and eye pain, Display Telecommunications will sell you the MegaBoard fully socketed for $200—with all the soldering done for you and all the hard-to-find parts (but none of the semiconductors) welded exactly where they belong. If you value your spare moments at more than $12.50 an hour (not counting the time that may be needed to fix your mistakes), you might choose to let DTC do the work.

If you do it yourself and you've not dealt with electronics before, you may encounter problems in soldering. John's biggest problem was in identifying the parts, which to him, could easily have been devised by another civilization. He received (from me) a box of miscellaneous parts lumped together with no individual identification except their own printed- and painted-on electronic codings. Without calling me, John could not understand the secret of the resistor color code and could not tell which of the strangely banded little cylinders belonged where. The handful of capacitors were similarly confusing, especially because some schemes for marking capacitors are apparently indecipherable even to experts.

Despite his ignorance of codings, John was probably a bit above the average—from his hi-fi kit-building experience he could differentiate between resistors and capacitors by shape alone. If you can't, the challenge of assembling a bare circuit board will be much greater for you.

The instructions that accompanied the MegaBoard particularly frustrated John. Although the three pages does list which general class of parts must be inserted step-by-step, and the circuit board is marked with legends that should tell you where each part belongs, John found that with the exception of the labels on the semiconductor sockets, the part numbers screened on the MegaBoard seemed to follow no particular pattern. C1 might be in the lower-left corner, C2 two-thirds of the way to the right in the rear, and C3 directly in the middle. A rather crudely photocopied picture of a completed board gives an overview of the parts layout, but John

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found it difficult to figure out where things went when he didn't know what he was looking for.

The next step was to put all those delicate integrated circuits into the right sockets, making sure each is pointing in the right direction. Be careful here—don't forget to properly ground yourself and your work lest an errant bolt of static electricity wipe out several hundred dollars worth of integrated circuitry. If it does, you'll never know until you turn the thing on and nothing happens.

The Bottom Line

Unlike many machines, a computer either works when you turn it on or it doesn't. If it doesn't, you've got to figure out how to bring it to life. That's why you need that thousands of dollars worth of test gear. Once you realize how much can go wrong, you'll probably learn how to pray again.

John's board did work, but he probably had an unfair advantage over the average nonelectronics type because I was looking over his shoulder the entire time. (I also had one of the $595, fully assembled MegaBoards to look at as a guide.)

Even if it works, you've only got roots of a computer system. The add-ons will easily double the drain on your bank account. To run the MegaBoard you need a power supply—suitable models are available through mail order for $60 to $80. Then you must add to that the peripherals you'll require: figure about $250 for a display adapter if you want to see what you're doing (IBM's own Color Graphics Adapter costs $245); at least $100 for a cheap, generic monochrome monitor; $200 to $350 for a somewhat harder-to-find disk drive adapter (I got a Tecmar for $345); and a disk drive or two at $225 to $250 each.

You'll also need a disk operating system and suitable software. Although the ROM you can buy with the MegaBoard will load an operating system, you cannot buy IBM's ROM chips—or any chips—loaded with cassette BASIC. Neither will the BASIC on standard IBM DOS disks run on the MegaBoard. You'll have to invest in Microsoft's GWBASIC to run IBM BASIC programs on your MegaBoard computer.

One way to get the IBM ROM chips is by buying a complete IBM XT motherboard as the basis for your home-built computer. IBM's price is $745 (according to my dealer), only $145 more than that of the fully-equipped MegaBoard—and the XT motherboard is probably more PC compatible. Of course, with the XT board you'll get IBM's cassette BASIC for free.

The MegaBoard can save you a substantial amount of cash if you search out cheap, perhaps surplus, integrated circuits and have the knowledge and skill to do the more tedious work yourself. However, if you cannot find cheap parts, or you do not know enough about electronics and elect to buy the MegaBoard fully assembled, the project is probably not worth it financially. You can most likely get a computer more cheaply and much more quickly and easily by buying an inexpensive "PC compatible." Single-drive systems, complete with software, have been advertised for $995 (although such a system is probably not as PC compatible as the finished MegaBoard.)

The MegaBoard can save you a substantial amount of cash if you search out cheap, integrated circuits and do the work yourself.

The best arguments for making your own computer are nonmaterial—the increased confidence and that certain pride you get from doing it yourself. ■

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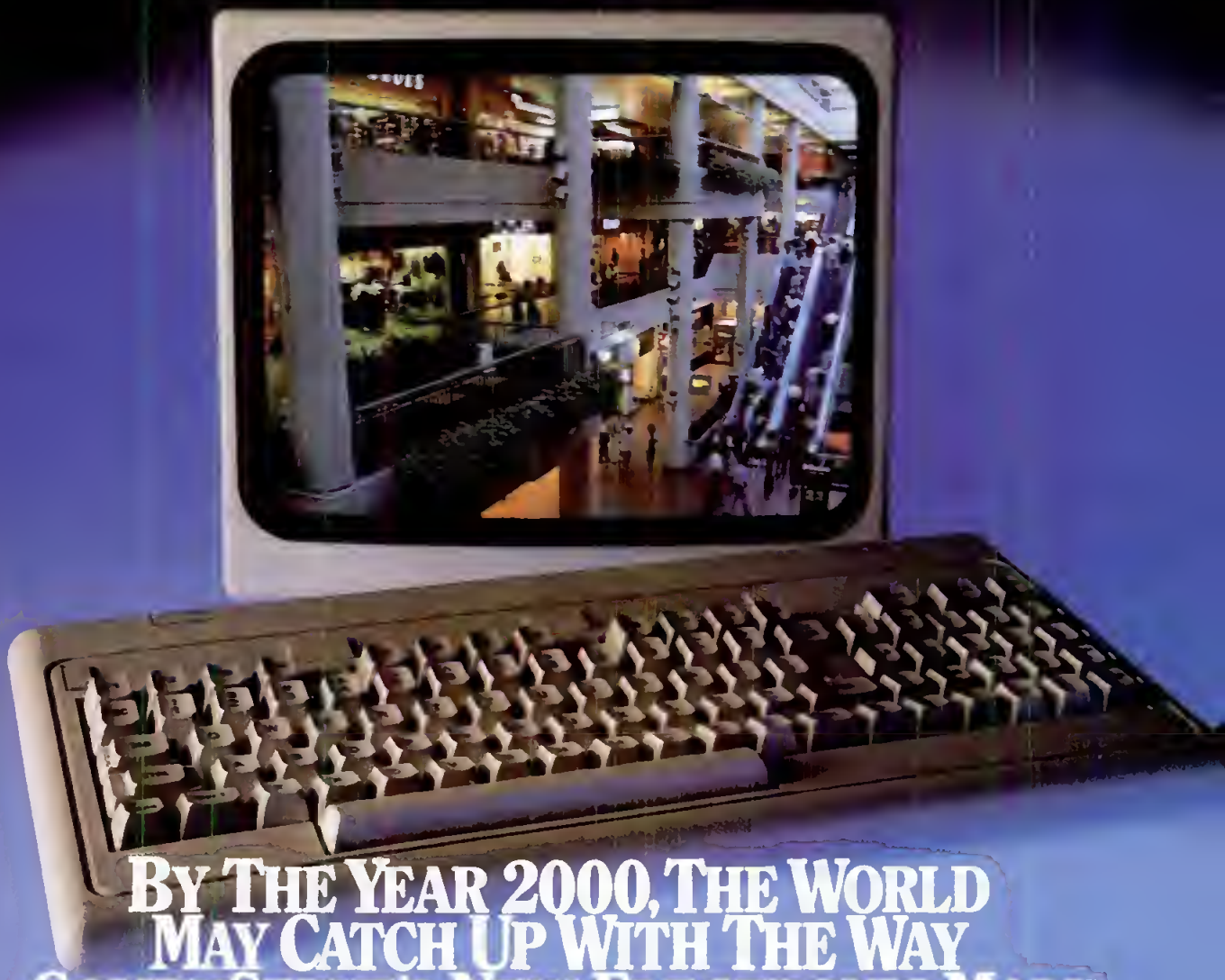

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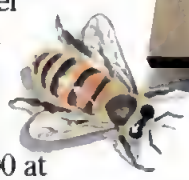

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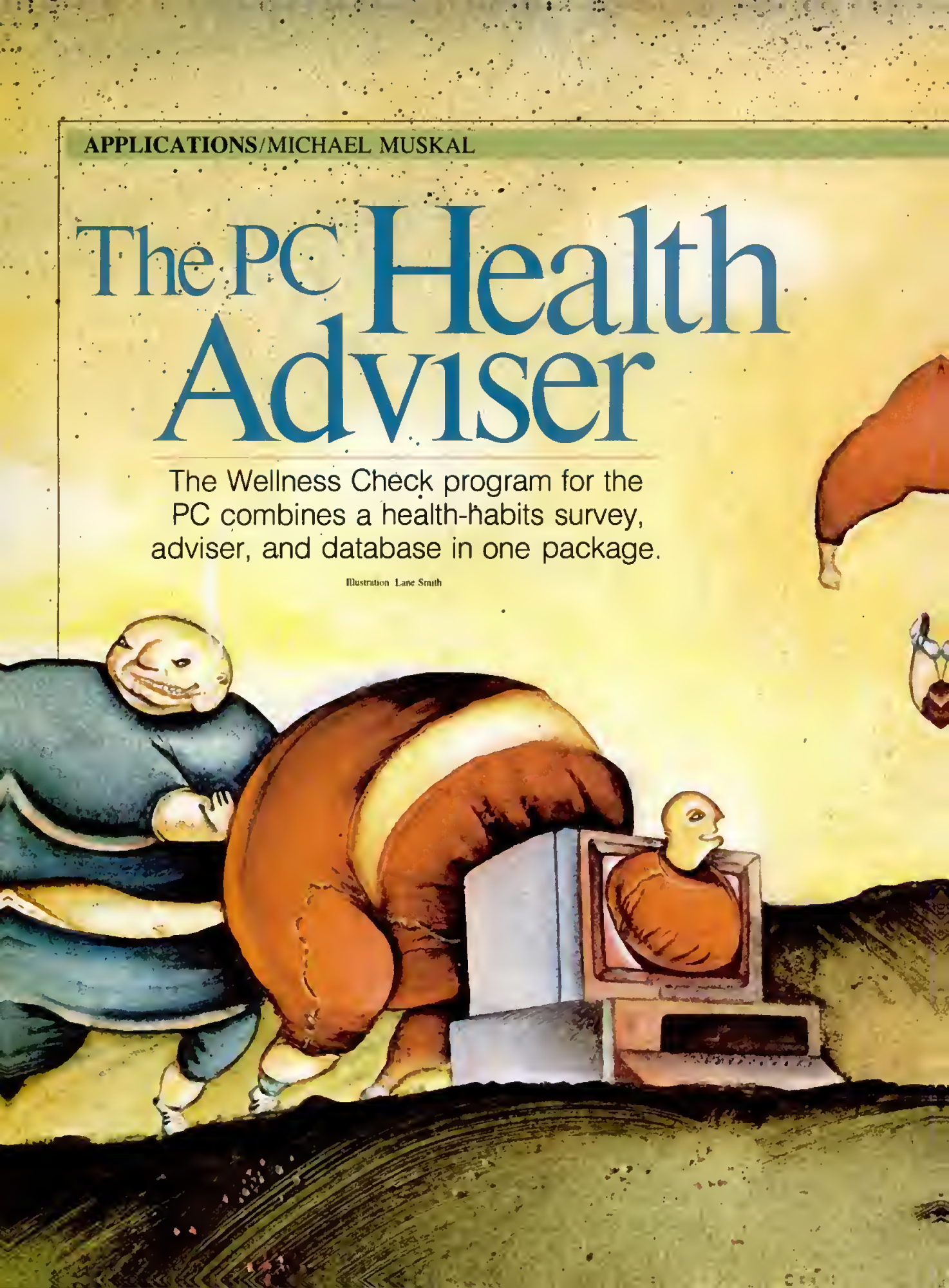
CIRCLE 256 ON READER SERVICE CARD

APPLICATIONS/MICHAEL MUSKAL

The PC Health Adviser

The Wellness Check program for the PC combines a health-habits survey, adviser, and database in one package.

Illustration Lane Smith



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PC HEALTH

Writing in the seventeenth century, the eminent physician, Sir William Petty, took a jaundiced view of the medical profession: "The number of people dying where the faculty of medicine is numerous . . . shows the value and effect of that art," he said.

Despite great technical advances in medicine, studies have shown that Petty was right: adding more doctors does not necessarily improve public health. Analyses of national and state health statistics have found, in fact, that behavioral and environmental factors have the most influence on health, particularly on the incidence of the four leading causes of death; heart disease, cancer, stroke, and accidents.

Researchers have long been analyzing those factors, both with manual and computer-supported methods. The PC is a new, less expensive tool for such research that can make it possible to study small groups, such as the employees of one company.

The Wellness Check

The Rhode Island Department of Health has been using PCs for that size and larger-scale studies with a software program it developed to assess how lifestyle affects health. It is called *The Wellness Check*. The program takes your answers to a health-habits and family-history questionnaire, scores them, and returns an immediate printout to you that assesses your major health risks and gives you advice. It stores the information you supply in a database for sorting and analysis. There are two versions of the program, one for adults and one for teenagers.

The Wellness Check
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List Price: $250
Requires: 48K RAM, one disk drive.

CIRCLE 799 ON READER SERVICE CARD

Originally designed to run on a SOL microcomputer, the programs have been rewritten for Apple and Radio Shack computers and, recently, for the IBM PC. "We wanted portability," said Larry Manire, the author, who now serves as consultant to the health department and is helping to upgrade the programs. The health department began selling the program commercially in the fall of 1982. "There are a lot of health-risk programs out there," said Louis Marciano, chief of the Rhode Island Office of Health Promotion. "But ours allows us to give people answers right there on the spot, instead of sending data to a mainframe computer and waiting days or weeks to get a printout."

The programs, which are written in interpreted BASIC, are designed to be run on a computer with at least 48K RAM and at least one disk drive. The programs permit direct data entry at the keyboard, or with an optical reader for high-volume testing.

The version of the program for adults asks you 47 questions, first eliciting such basic information as sex, age, body frame size, height and weight. It asks you how often you eat foods from the basic groups, whether you limit your intake of saturated fats, cholesterol, salt, and refined sugars, and whether you eat a balanced breakfast. It also asks you how often you do aerobic exercise, whether you smoke, and how much alcohol you consume. Since car accidents are a health risk, it asks if you wear seatbelts or ride with drivers under the influence of alcohol or drugs. Your sleeping habits, depressions and anxieties are examined, as are any special occupational health problems ranging from high noise levels to hazardous chemicals. You also must discuss your innoculations, how frequently you have your blood pressure checked, and any family history of heart disease, stroke, or diabetes.

The version for teenagers is slightly different, focusing on such areas as sexual education, illegal drug use and hitchhiking. After you complete the questionnaire,

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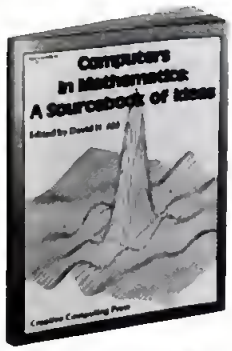

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the data is entered into the computer, which produces an immediate printout that can be handed to you, said Marciano. "You get a numerical score and can see where it fits into the four categories from excellent to hazardous," he said. "The printout then indicates the areas where you are doing well and where there are problems." Once your health problems and risks are diagnosed, the health department then gives you booklets telling you where to go for help or how to help yourself.

Going Commercial

In Rhode Island, the health department has mounted its computer system in a van so it can do "wellness" surveys at factories, offices, and even shopping centers. Originally, the program was designed just for the state's use. "When we started the program we had no idea of going commercial," said Marciano. "But word spread. At first people would send us their surveys and we would process them. But when we had accumulated about 40 customers, we decided that if all of these people wanted the program, why not sell it?"

Because the software was developed for a state government agency and not for the software market, the department was unsure about how to price and distribute it, said Manire. "I don't think the private sector ever would have developed this kind of survey, because the cost is so high." The state finally decided to charge $250 apiece for the adult and teenager programs. The version that permits input with an optical reader costs an additional $45. The income, said Marciano, is used to defray the development costs and fund other health department programs.

"We have sold 84 of our programs, 3 to Canada and the rest to state health departments, universities, and private consulting firms. We've even translated the programs into Spanish," he said.

A Health Database

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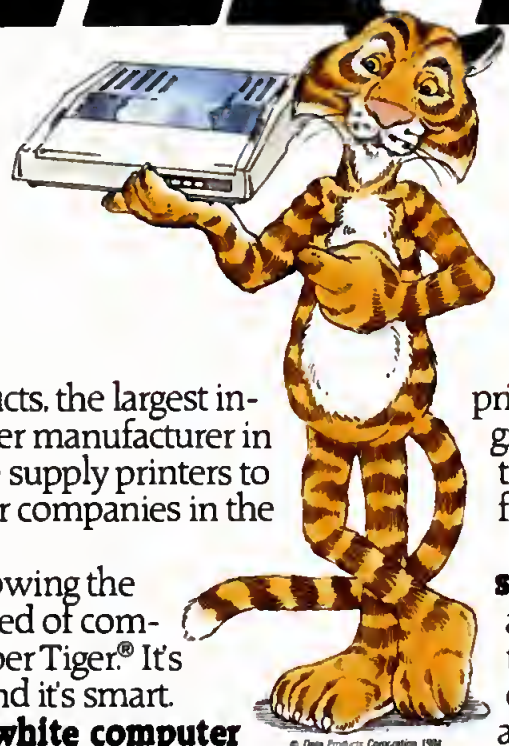

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CIRCLE 110 ON READER SERVICE CARD

ly 30,000 Rhode Island residents. Analyses of these data allow the health department to decide what public laws and regulations should be developed and proposed, said Marciano. He said that although many statistical studies have documented the dangers of smoking, obesity, and not wearing seatbelts, less information is available on how many and what people run these health risks.

"*The Wellness Check* gives us a way of measuring," he said. "Here in Rhode Island, we discovered that only 13 percent of those surveyed told us they were wearing seatbelts. Using that data, last year we went to the Rhode Island General Assembly and said, 'Hey look, people aren't wearing seatbelts and you should do something about it.' With any kind of luck, Rhode Island will become the first state to require the use of seatbelts. If the bill that has been introduced passes, it will be largely based on the numbers we were able to gather," Marciano said.

The health department has also been trying to correlate high incidences of health risks with residence in particular areas so that local groups can determine what remedies should be applied, said John Shields, a state health-risk specialist working on the project. "In January, said Shields, "we found that hitchhiking in one rural county was 10 percent higher than the state average. The school principal was very concerned and now the school district is studying whether to increase students' access to busing."

"What we do," said Marciano, "is present the facts. Local officials know how to address their own needs better than we do."

Sorts and Cross-Tabulations

The *Wellness Check* programs are capable of limited sorts and cross-tabulations of up to 13 key risk factors. In future editions, the department is hoping to expand the sort functions and to add a program for surveying dental risks.

The program's sorting ability has allowed the department to test specific groups of workers for key health-risk factors and make recommendations on health policy to private employers. "We can develop a profile for a group, break it down by sex, age group, and by score to tell who is in the excellent, fair, risky, and hazardous categories," said Marciano. "Then, we can compare this particular

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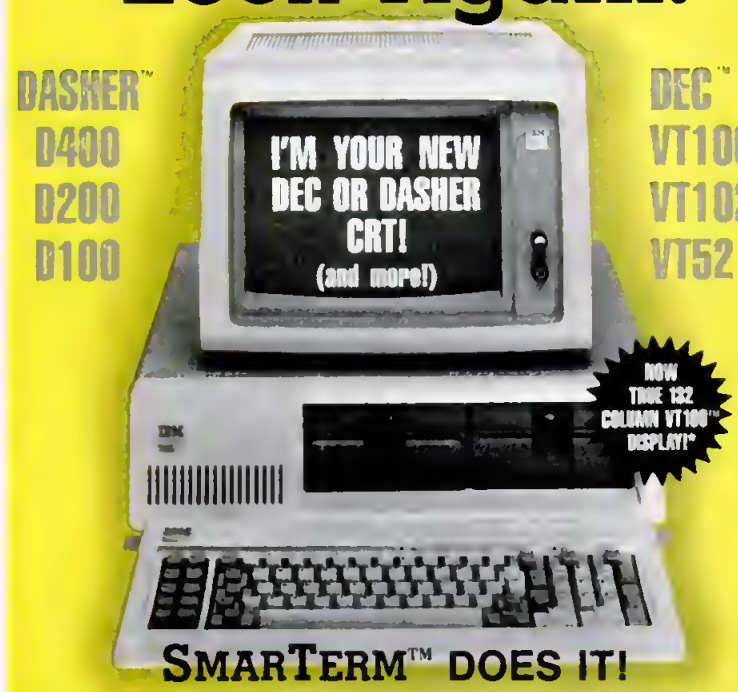

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group with all other Rhode Islanders on the data disk, and say, for example, 'Only 9 percent of your workers scored in the excellent category but statewide, 27 percent got an excellent score.' Another methodology allows us to compare risk factors by cross-tabulation, and discover, for example, that 20 percent of the women using the pill are running a serious health risk. Because we have several questions on occupational health, we can go to a company and determine that because it uses vinyl chloride, its workers run a greater risk to their health."

Despite some resentment from a public employee union about what it saw as "unfavorable" findings, in general, most tested groups have responded positively.

Wellness Programs

Hoping to reduce health care costs and absenteeism, many employers, including the health department itself, have used the computer's results to design exercise, educational, and incentive programs to encourage better employee health habits.

"It's too soon to judge whether there has been a financial improvement, but there certainly has been an improvement in morale," said Marciano.

BIF Industries, a manufacturer of meters and valves, used *The Wellness Check* program to evaluate its 200-employee workforce in January, said Carolyn Laskowski, spokeswoman for the company. The program "sounded interesting as a way to get an overall view. We're really pleased with the results."

The biggest, so to speak, health problem among BIF's employees was excess weight. "I guess they just like to eat," Laskowski theorized. "We are going to have a health fair in April, and after that, we'll make decisions about diet and weight control.

In another implementation, the Wiring Device Division of General Electric in Warwick, Rhode Island, has decided to begin developing recreational and dietary programs for its 250 white-collar employees. The company is considering using *The Wellness Check* program to survey its employees this spring. "I don't see how you can go wrong, sponsoring a wellness program," said company spokesman Bob Watson. "You hope, as a byproduct, to see insurance costs go down, but in any case, you're making people better employees, a gain in itself." ■

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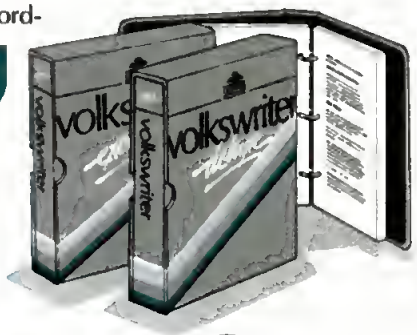

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Negotiating the Course to Used Computerdom

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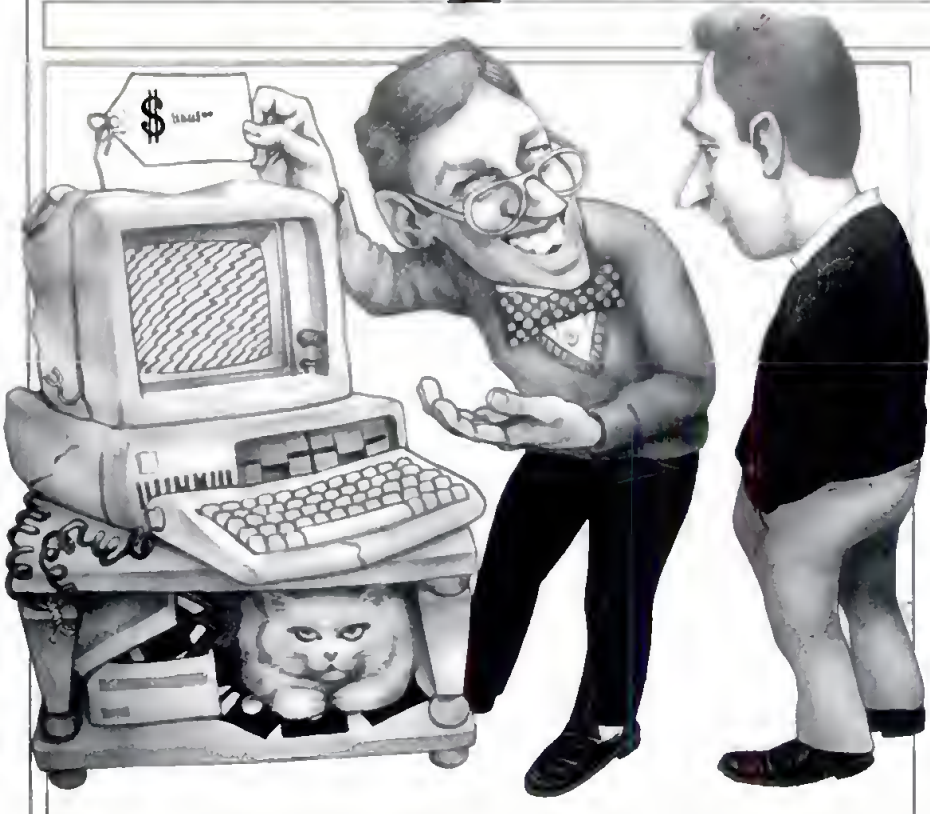

Okay, you've got the fever. There's no sense in denying it. You salivate when you see a slick color photo of a PC beautifully adorned with holly green diodes and licorice-length ribbon cables. Suddenly your strongest need after food, clothing, and shelter is the need for power—computing power.

So you smash open the piggy bank you've had since first grade, collect your credit cards and savings passbook, and march down to the nearest computer emporium to beg, barter, or buy your way into the age of machine intelligence. Four stores and twenty business cards later, you start to desperately scan the back pages of computer magazines for that once-in-a-lifetime deal. Still, your hard-earned dollars won't pay for your passage into computerdom.

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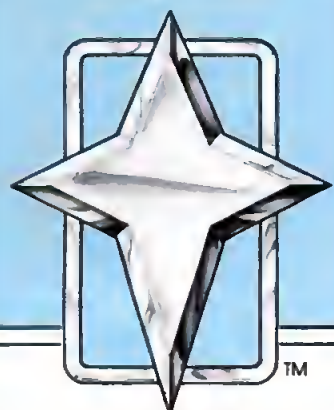

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USED COMPUTERDOM

preowned computer.

IBM has been cranking out large numbers of PCs for almost 3 years. Big Blue hit the market with the force of a tidal wave, but now hardly a day goes by when a new and better PC compatible isn't launched into orbit. Today's improved technology means that the pioneers who bought yesterday's PCs are, in a sense, operating with obsolete equipment. That's okay for the average bloke. But some people wouldn't be caught dead with a machine older than 6 months. For status, largess, or whatever reason, they drive factory-fresh-smelling cars and compute with the latest electronic wizardry. When these people move up on the ladder of processing power, they're faced with the problem of unloading their old machines. But few computer stores will touch a system that came off the shelf even a week ago. The types of trade-in deals that Ford and Chevy dealers welcome with open arms won't get them the time of day at the local computer store. So, many of these PC connoisseurs attempt to hawk their trusty old systems to bargain hunters like you and me.

Where to Look

Where do you find that preowned machine, the one that was used by a little old lady to file recipes on Sundays? For the most promising leads, focus your search on three hunting grounds: newspaper classified ads, user groups, and college bulletin boards.

The classified ad is the time-tested technique of sellers everywhere. A recent edition of the *Washington Post* listed about two dozen personal computers, some of them with "IMB monitors" and "debase 2" software. Although the ad reps are still catching up on computerese, in one area their accuracy seldom fails—price. Sunday newspapers usually list the most ads, since the circulation is often greatest for that issue and sellers and buyers tend to trade on that day.

If you live in a small town, consider the metropolitan newspapers of nearby cities. The long-distance phone calls and driving expenses can be recouped several times over with savings on the purchase price.

Next stop on the bargain tour of PC land is user groups. User groups seem to spring up whenever two or more programmers or computer enthusiasts meet over a beer. These groups can provide a wealth of information not only on the used machine market, but also on what software plays the sweetest music on a PC. The group's newsletter is a good place to start your search.

I've had the best luck reaching local user groups by inquiring at a computer store. Groups frequently hold meetings in the stores, and store managers usually know the group officers. The "Club News" section of *PC Magazine* also lists information on user groups.

While you're waiting for the next edition of the Sunday newspaper and user group newsletter, check in at the local college bulletin board. Watch diligently at semester breaks when graduating seniors peddle their trusty PCs for cold cash. At large universities, look at department bulletin boards, too. The computer addicted tend to gravitate to the computer science, electrical engineering, and mathematics departments.

The Shakedown

After you track down a preowned PC, what comes next? Seasoned users know how to "kick the tires" of a recycled computer. But if your programming experience has been limited to setting the timer on a microwave oven, you would be well advised to retain a guide. Even if you're a veteran at bargain hunting, you'll be entering a whole new ball game. The seller shows you a chip-studded board. Is it a 512K RAM add-on as claimed, or a stray part from an army surplus walkie-talkie? Does that floppy disk with a directory chock full of files really contain $2,000 worth of software? These questions are best left to a seasoned user, and having one at your side when you're looking at a used computer will reassure you.

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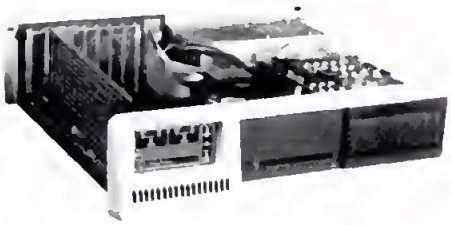

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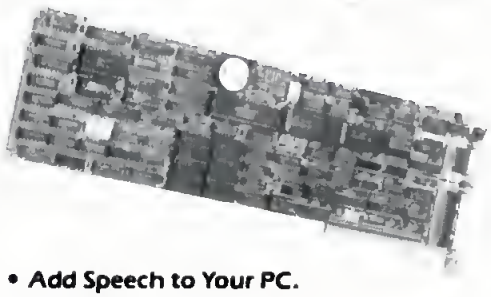

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At this point, you may wonder if you'd be better off investing in snake oil or guitar lessons. Don't despair; it's a normal reaction.

Finding such a guru to help you avoid the pitfalls is easier than it may at first seem. A business associate or friend who has the same type of computer you plan to purchase is ideal company. He can put the machine in question through the paces.

In the absence of a friend with a guiding hand to hold on to, you'll want to make the acquaintance of one or two experts from the local user group. You might offer $25 an hour for advice, which will probably be well worth the price. "That consultant may be the most valuable peripheral you could possibly have purchased," says Peter McWilliams, author of *The Personal Computer Book*.

Once you feel confident in your own expertise or in the company of an expert, how can you be sure that you're not getting a unit fresh from 2 years of duty collecting data on the slopes of Mount St. Helens? You may never know, but if you stick to the advice presented here, you can be sure that 99 percent of the system works.

The (In)voice of Experience

First, ask the owner for all paperwork associated with the computer. Original sales receipts, repair invoices, software licenses, and the like can help pin down the exact age and condition of the machine. Furthermore, if the PC is relatively new (that is, purchased less than 90 days ago), then it's probably still protected by the manufacturer's warranty. (Most PC manufacturers—including IBM, Compaq, Columbia, Corona, and TI—offer a 90-day warranty.) This warranty is tied to the machine serial number and is therefore transferable.

Surprisingly, many people misplace these important documents. They may file them between junk mail and old newspapers, where they will never again see the light of day. Don't be appalled if the owner produces nary a shred of paper documenting the original purchase, especially if the warranty has expired.

At any rate, regardless of what the sales receipts and repair invoices say, you (or your expert sidekick) will want to go over the computer with a fine-tooth comb for 1 or 2 hours to judge its value.

Start by eyeballing the exterior package. Is the cabinet nicked and dented, as if the computer had been in live combat? A battle-scarred enclosure may indicate premature aging, despite a recent sale date. Next, check the screws and bolts connecting the cabinet to the chassis. Does it look like the machine is dismantled daily with a butter knife? If so, quiz the owner; trouble may lurk under the hood.

After grading the external package, proceed one level deeper to a detailed examination of the system's key components. Turn on the unit. Does the system boot the disk without an error? If so, the electronic innards are probably in good shape. Every time the IBM PC is powered on, the major internal components, including the 8088 microprocessor and RAM, as well as the keyboard, disk, and CRT interfaces, are tested. If one of these components fails, the PC won't even break the huddle for the first play.

Now take a close-up look at the keyboard and inspect the surface. Is there enough dust between the keys to plant a garden? Excessive dirt may interfere with the key contacts and can eventually lead to a hefty repair bill. Do all the keys work? Simply press each key in shifted and unshifted modes to verify that the correct character is generated. Watch for keyboard bounce as the characters appear on the screen. Keyboard bounce causes one key depression to generate 30 or 40 characters. These unsolicited key repeats can play havoc on your typing modus operandi. Don't forget to test the numeric pad, control characters, and function keys.

While you're banging away at the keyboard, you can easily begin testing the printer. Have the system echo at the printer what's displayed on the screen by entering Ctrl-P. Then verify that the printer

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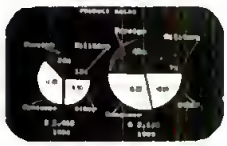

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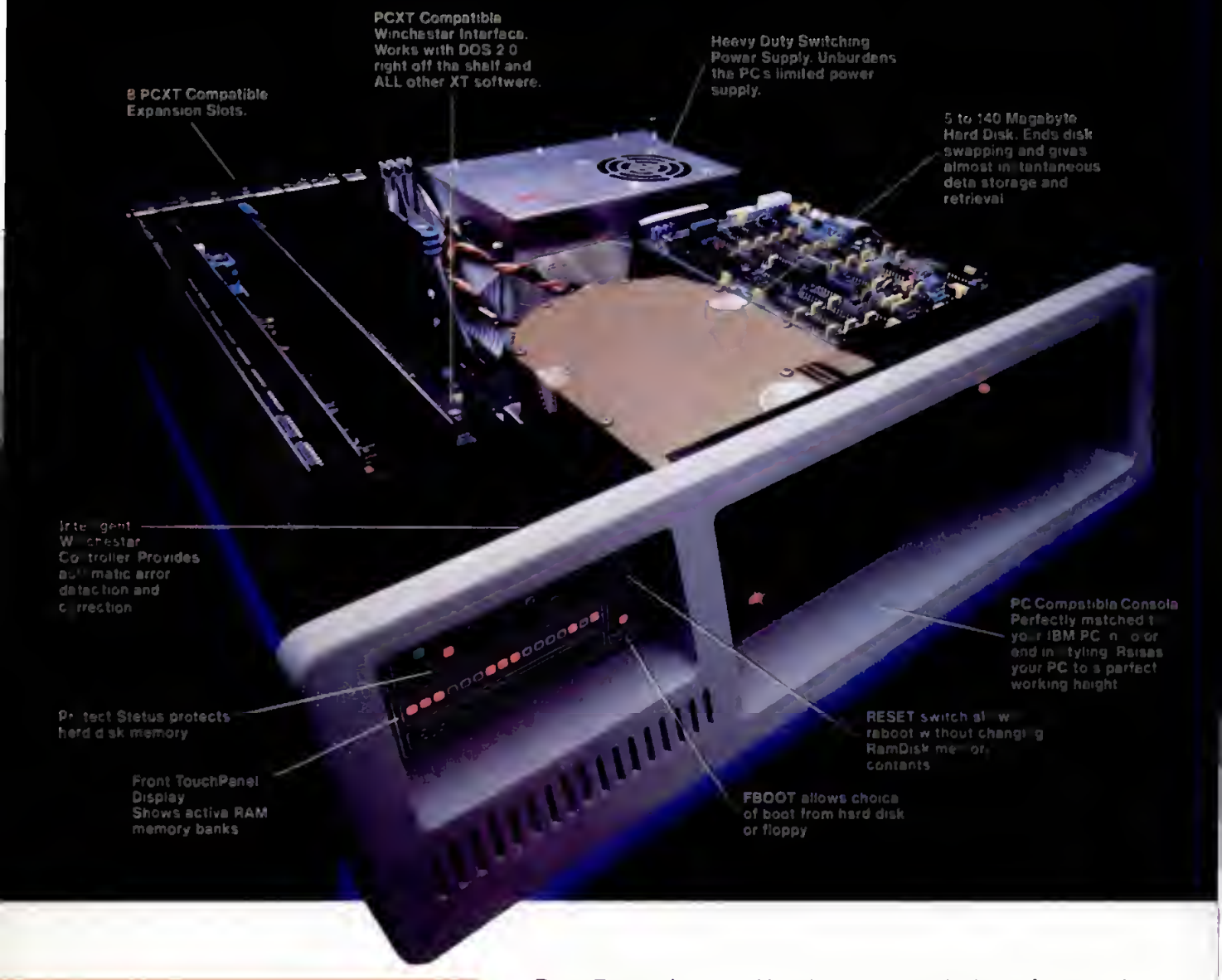

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types each character clearly, without shadows or weak impressions. For example, in the sequence "TTTLLL," the printer should type the crossbar of the *T* and the lower part of the *L* with equal crispness. If not, an adjustment may be needed.

Checking each printed character is more critical on a letter quality printer that relies on a daisy wheel or thimble than it is on a dot matrix printer. A dot matrix printer combines dots to form characters. If it can construct a few characters, chances are it can form the entire alphabet. Letter quality printers, on the other hand, have separate plastic or metal elements for each character. My Qume printer, for example, has 96 elements for printing the uppercase and lowercase alphabets, digits, and punctuation symbols. Once I had to replace the daisy wheel after the letter *r* started disintegrating and typed what looked like a shaggy *i* instead.

A faulty daisy wheel or thimble, however, shouldn't keep you from buying the printer. The plastic elements do wear out. Figure on spending $10 or $20 to replace the worn part.

The other facet of printer performance that you should check is full-page printing. List a multipage document with characters extending across the width of the page. Do the characters appear as clear in column 80 or 132 as they do in column 1? Does the printer skip past the perforation correctly when continuous form paper is loaded?

With the keyboard and printer exercised, you've checked out two-thirds of the mechanical components. Now comes the time to cross into the world of disk drives. Analyzing a disk drive is an art that has yet to be mastered. Combine the genes of Sherlock Holmes with those of a space shuttle astronaut, and you may get the first living being who truly understands the technical mysteries of disk drives. In the software development department of a computer company, I can always pick out the most experienced people: They burn incense on top of the drives to ward off evil spirits. In other words, shaking down a disk drive baffles even the experts.

Nonetheless, there is a brief process that will instill confidence in the disk drives. (Saying absolutely that a drive functions correctly is like predicting the weather. You can never tell from one minute to the next.)

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media in unfamiliar disk drives), execute a disk copy program to copy disk 1 in drive A to disk 2 in drive B. While this program is running, keep your eyes and ears peeled. Watch the screen for error messages. Listen to the drives for unusual sounds.

A marginal drive sounds as if it's gargling because of constant retries.

What are unusual drive sounds, you ask? When a disk is being copied, healthy drives issue a series of clicks as the drive head moves to each track in a sequential fashion. If the disk drive or media is faulty and fails a read or write on a given track, the disk copy program will invoke a retry procedure to copy the track. (Retry, for those technically inclined members of the audience, consists of restoring the drive head, reseeking to the desired track, and repeating the read or write operation.) Retries are usually repeated up to three times before an error message is posted on the screen.

If the disk drive is marginal or in need of adjustment, it may retry numerous times to read and write an entire disk successfully. Instead of producing reassuring steady clicks while copying, a marginal drive sounds as if it's gargling mouthwash because of constant retries. Assuming that the copy completed without incident, you should then repeat the procedure, reversing the disk—namely, copy disk 2 in drive A to disk 1 in drive B.

You can test hard disks with a similar procedure. Copy all files from the hard disk to floppy disks using the BACKUP utility. Then, reversing the process, copy the floppy disks to the hard disk using the RESTORE utility.

If the hardware performs flawlessly up to this point, you're probably on to the right stuff. There are diagnostics available from IBM and other manufacturers that

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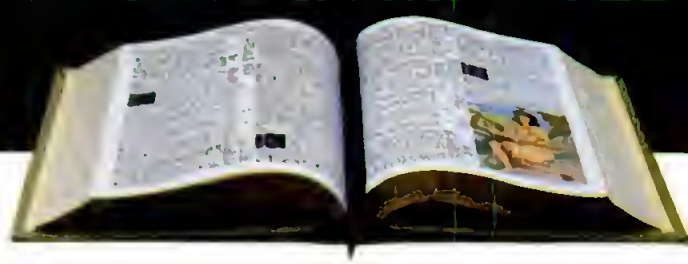

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USED COMPUTERDOM

allow you to further test the equipment with the same tools that repair technicians use. The investment of about $155 for IBM hardware diagnostics can give you an additional layer of security.

Software or Wornware?

The next item to be evaluated is the software that may be for sale along with the machine. The value of software certainly defies detection with the naked eye. Buy $1,000 worth of computer, and you have something to show for your money—something you can wrap your arms around and plug into the wall and turn into a boat anchor if you so choose. But try convincing the computer illiterate that a $5 disk with the right magnetic signals scribbled on it is suddenly worth 100 times that much. In the high-tech arena, one learns quickly that big (translated "expensive") things come in small packages.

Software ownership can be transferred, in many cases along with the rights to warranty protection and discount upgrades that many companies offer with original purchases. Ownership transfer of Microsoft products is accomplished by re-registering the software. For example, if John sells his entire system to Jane because he's joining a Buddhist monastery in the Himalayas, then Jane can register herself as the new owner of the software by completing and sending a registration card to Microsoft. At the same time, John must, in the words of the license agreement, "transfer the program and documentation and destroy the backup copy."

Since the complexity of sophisticated software often ranks a notch below that of DNA molecules, comprehensive evaluation can be a major undertaking. Menus nest submenus that split into options with special cases embodied in 57 varieties of modes. A function chart resembles a genealogy tree tracing the human race back to Adam and Eve. How can the earnest buyer determine that the whole shebang works as advertised? If the product is still accompanied by its original documentation and distribution disk, that says something. At least you know there was a *WordStar*, *Multiplan*, or *dBASE II* on that disk at one time. Try invoking the program. Does it even get to first base? Enter several lines of text in a word processor or add a column of numbers in a spreadsheet. List a few pages if the program includes printing. A program not configured correctly for the hardware environment will change your outlook, and possibly the offering price, on the system.

If the software behaves obediently after 5 minutes of flipping through screens and randomly sampling the offerings, chances are it's on solid ground. Masquerading any major software with a contrived program is no mean feat. The effort would hardly be worth it.

One positive aspect of purchasing used software is that it never wears out. Unlike keyboards and disk drives that start aging as soon as they're unpacked, a program forever remains as fresh as the day it was born.

Negotiating Dollars

You've turned the system inside out, left your fingerprints on every switch, dial, cable, and key, and are satisfied that you have a genuine, bona fide, working computer. Now comes the time for the delicate negotiations of price.

Before you bid a dollar figure, you should assess the value of the system. Naturally, you'll want to know what the current retail price is. The owner may be anxious to show you the original sales receipts to demonstrate what a bargain you're getting. Alternately, you can determine the list price by perusing the advertisements in magazines or calling a computer retailer. Pay close attention, also, to the asking prices for similar used systems in newspaper classified ads. This will give you a feel for the market value.

Chiseling away at the price may be a futile exercise in some situations. Say the owner has the only PC in town with a color card; there's a 6 month lead time in getting one of these cards from the neighborhood computer supermarket; and the phone has

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been ringing off the hook since you arrived for a demo of the system. Your offer of $700 less than the asking price may get you an escort to the door.

Still, I would start with a lower bid, even if you're prepared to pay the full price. The owner has a buyer in hand. Being able to collect your greenbacks instead of arranging for more demos of the system could entice the seller to accept 5 or 10 percent below the asking price.

On the other side of the fence, if the classified ads list endless columns of Screaming Panther personal computers for sale, then you have more leverage to influence the price to your advantage. With the constantly evolving state of the information business, computers rapidly lose their sheen. In a year, the used Screaming Panther will probably be worth only half of its present value. Every day the sun sets, the procrastinating seller is losing money.

Another factor affecting price is how the seller bought the system. Count your blessings if the owner is employed by a computer company that makes PC's. As a fringe benefit, most PC companies sell systems to employees at significant discounts, often amounting to 25 percent less than suggested retail. The employee-owner's sale price may reflect this savings.

After settling on the price, pay with a cashier's check, money order, cash, or at least secure your purchase with a down-payment until you can deliver the balance. Personal checks don't hold much weight with a stranger. Flash a cashier's check, however, and you can walk out with the system in tow.

Banks issue cashier's checks and money orders only for specific amounts, and this may present a problem. While it's nice to have negotiable funds in hand when you visit the owner for a demo, you may want to haggle over the final sale amount. In this case, combining a cashier's check with cash can give you payment flexibility, yet you won't feel like a walking cash register because your trousers are stuffed with C-notes.

Buying a preowned computer is an economical way of treating gotta-have-a-PC fever. The journey into used circuitry entails its share of risks, but if you stay alert, proceed cautiously, and inspect the prospective machine as you would a spouse, you should be able to garner solid computing power without having to mortgage the house. ■

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Educational Quests

Two new educational computer games by elementary school teacher Tom Snyder, one pure adventure and the other business strategy, are both fun and intellectually stimulating.

Tom Snyder, who is best known for *Snooper Troops*, develops educational computer games, the latest of which are the imaginative adventure games *In Search of the Most Amazing Thing* and *Run for the Money*, a business strategy game.

Run for the Money is an exciting, strategic, two-player game. It is also a clever simulation of how to run a business, and the first in a series of business-oriented games for Scarborough systems.

The pregame scenario goes like this: Your spaceship and that of your opponent have crashed on a strange planet, stripping the paint off their protective shields. The object is to buy enough paint to repair the shields and be first to blast off the planet. But you each land with little money, so you must go into business and make a cash profit. The business to go into on planet Simian is "synannas." You will try to buy things called "Rufs," turn them into synannas, then sell the synannas to the Simians for the best price you can get.

It sounds simple, but *Run for the Money* is surprisingly deep. It involves principles of supply and demand, competitive pricing, bidding, market structures, production processes, and much more.

The action takes place on a screen showing your grounded ship and that of your opponent as mirror images of each other, and six *Rufhouses* where you can buy raw materials (the Rufs) from the Ruffians.

You and your opponent each use four different keys to move your characters, called Bizlings, around the screen. A fifth key is used to make selections. To buy Rufs you simply move into the Rufhouse of your choice. When you see a good price, press your selection key to seal the deal.

Rufs are deposited in a storage area on

Run for the Money
Scarborough Systems, Inc.
25 North Broadway
Tarrytown, NY 10591
(914) 332-4545
List Price: $49.95
Requires: 64K RAM (DOS 1.1) or 128K RAM (DOS 2.x), one disk drive, color/graphics adapter.

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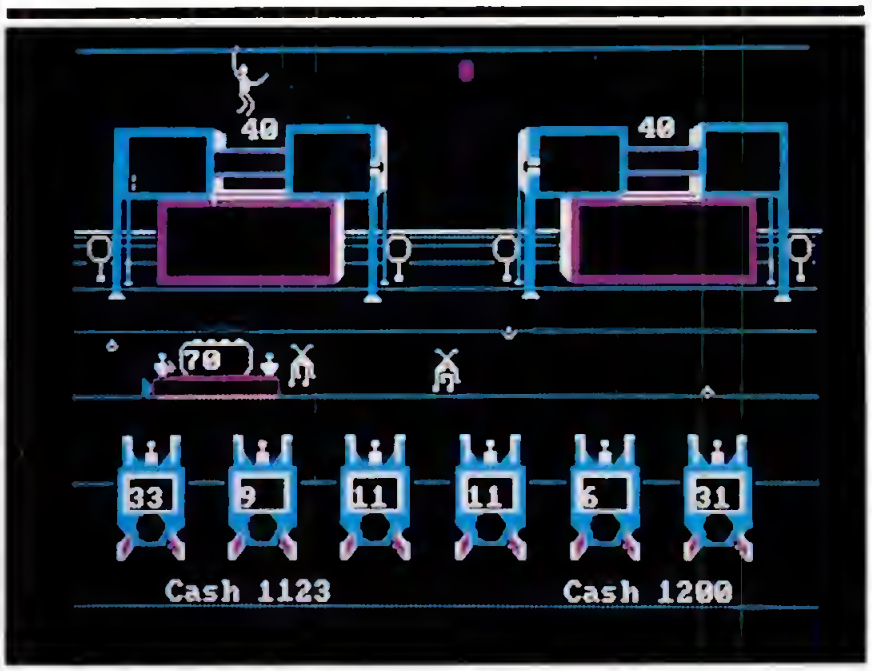

In *Run for the Money*, a Simian customer swings by a spaceship selling synannas.

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PC ARCADE

your ship near the edge of the screen, beneath which is a plunger. To begin making synannas, you simply position your Bizling over the plunger and press your selection key. Synannas automatically appear in another storage compartment near center screen, ready for sale to any Simian who swings by.

To make business decisions about quality of Rufs to buy, pricing of synannas, and advertising, you can use the wonderful What If Machine, which is part of the program. Snyder wanted to show how computer tools work and how fun they can be to learn. The What If Machine performs economic forecasts; it sets up an economic model of your situation and allows you to experiment with various data, to see what would happen to profits if you spent more on advertising, for example, or bought higher-quality Rufs.

You can take a random Monkey Survey to determine what the Simians think of your synanna prices. And there's even a newspaper that displays current events that might affect your business strategy. Using all these tools is half the charm of playing and delivers educational value, too.

Occasionally, you will see a character named Hyam Mighty, a brilliant scientist who sells the exact paint you need to repair your ship's screen and blast off. But he never offers much paint for sale at one time, and your opponent is after it, a situation resulting in a clever paint auction that gets the words flying between players. This system means repainting is done in stages, although you don't have to paint your entire screen to make it through the Simian atmosphere. The game ends when one player successfully blasts off.

The game manual, which deserves special mention for its clarity and organization, encourages further reading on the subject of business with a bibliography of both fiction and nonfiction titles. Game time may run from 15 minutes to an hour or more, and your current position can be saved on the game disk at any time.

On *PC*'s scale of one to six, *Run for the Money* rates:

FUN:	5.5
CHALLENGE:	5.5
GRAPHICS/SOUND:	5.0
TOTAL SCORE:	16.0

(continued)

Interior of B-Liner in *In Search of the Most Amazing Thing*.

PC ARCADE

In Search of the Most Amazing Thing
Spinnaker Software Corporation
215 First St.
Cambridge, MA 02142
(617) 868-4700
List Price: $39.95
Requires: 64K RAM, DOS 1.x, one disk drive, color/graphics adapter.

CIRCLE 693 ON READER SERVICE CARD

Although this graphically appealing adventure game was designed for children as young as 10, it is not what we traditionally think of as child's play. In fact, it will serve adults as a good introduction to graphic adventures. The elusive object of the quest, known only as the Most Amazing Thing, is hidden in one of 25 different areas of the continent of Darksome Mire, which is inhabited by beings of different cultures. To retrieve it you must not only learn how to navigate the strangest craft you'll ever pilot, but find the culture where the Most Amazing Thing has been placed. You must also learn the different languages of antennae signals.

The game starts with an auction phase. The screen displays an underground elevator you can take to four areas: the apartment of your uncle, Smoke Bailey, the store, the auction, and the planet's surface where the rest of the game will take place. Uncle Smoke has given you his B-Liner exploration craft, but it needs to be outfitted at the store with navigation instruments and software for its computer before you attempt to go anywhere.

You begin with five yellow, five red, and five green chips, the planet's currency—not enough to buy even one item from the store. So you must visit Uncle Smoke for advice and an item of value from his travels to be auctioned for chips.

At the auction are nine robots who will buy Smoke's items if you set a fair price, and figuring out how to do that is lots of fun. When you suggest a price, the robots' responses are shown above their heads. I've encountered at least a dozen different responses. Somehow, you must use their

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responses to gauge their willingness to buy at your suggested price.

Once you have amassed some green chips by trading with the robots, you can go buy things for your journey from the store, where items are laid out supermarket-fashion with fixed prices. You can buy eight instruments for your B-Liner's control panel that show your compass direction, altitude, and fuel and help you find the huts of the different cultures on the map. Five pieces of computer software are also for sale, such as the CULTS program that will give you information about any of the 25 different cultures.

You can keep going back to Smoke as many times as you like. He never runs out of things you can trade or advice about what to expect in the outside world. And you won't be killed off quickly.

The first thing you've got to do once you venture out on the planet surface is learn how to use your character's jetpack to maneuver it into the B-Liner's hatch. And then you've got to learn how to fly and drive this weird, half-dune-buggy, half-hot-air-balloon craft. Driving across the surface of the planet is straightforward, but flying is much more difficult.

The planet is divided into 25 irregularly shaped cultural areas, more interesting than a squared-off grid. The map in the manual labels each culture and shows location coordinates that divide the map further into 625 small sectors.

When you locate the hut of a culture you wish to visit, you land as close to it as possible and then drive the B-Liner to the door. Once inside you find yourself at one end of a bargaining table that has a strange-looking creature at the other. The creature signals with an arrangement of antennae about where the Most Amazing Thing cannot be found. You can eliminate those areas on the map.

In Search of the Most Amazing Thing engages youngsters with its logic, humor, and well-planned pace. And if you think it can be solved by an adult in an afternoon, forget it. I've been playing every night for a week and haven't found the Most Amazing Thing yet.

On *PC*'s scale of one to six, *In Search of the Most Amazing Thing* rates:

FUN:	5.0
CHALLENGE:	5.0
GRAPHICS/SOUND:	5.5
TOTAL SCORE:	15.5

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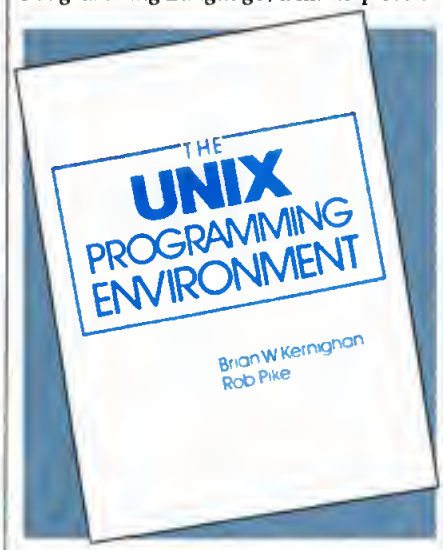
The Good, the Best, the Ugly: Three UNIX Books

Three newly released books on UNIX all tell much the same story; one may become the new standard, another is an intelligent overview, but the third founders on poor production.

Ever since MicroSoft announced that MS-DOS would grow to look more like UNIX in future releases, it's been incumbent upon IBM owners to learn something about AT&T's wunderkind operating system. If you think UNIX sounds like a chic club for celibates, these three recently released books will set you straight. Two of them are highly recommended. The third, through no fault of its authors, is too poorly proofread to be much use to anyone.

All three books cover similar ground in much the same way. All state that they aren't intended to substitute for the official *UNIX Programmer's Manual* published by AT&T; all start with tutorials that explain how to log on to the system and sniff around; all progress to more ambitious material like compiling and running programs. And all contain glossaries or appendixes of technical information. None of them specifically mentions implementations of UNIX on personal computers.

The UNIX Programming Environment by Brian Kernighan and Rob Pike is by far the best. It is a shining example of how to make a difficult subject appealing through an elegant and sophisticated presentation. That comes as no surprise to fans of *The C Programming Language*, a masterpiece of technical clarity that Kernighan co-authored with Dennis Ritchie in 1978 and that made *"K&R,"* an abbreviated term for the book, a buzzword among computer cognoscenti. *"K&P"* is an equally important book.



The copyright page explains that *K&P* "was typeset in Times Roman and Courier by the authors, using a Mergenthaler Linotron 202 phototypesetter driven by a VAX-11/750 running the 8th Edition of the UNIX operating system." This note not only shows the pains the authors have taken to produce a legible document, but is a good example of the care they took to provide the additional information their more advanced readers might legitimately want. At the end of each chapter is a history and bibliographical notes section full of useful citations and suggestions for further reading. I have rarely seen a textbook so bulging with pertinent information.

One of the great pleasures of reading *K&P*, especially for those who knock their heads against technical literature for a living, is the wide variety of fonts used. In particular, examples of commands to be typed at the computer terminal are shown in a monospace font, which means that a single space looks like exactly one single solitary space. In many computer texts, such examples are printed in a proportional font, making it hard to determine how many spaces appear between two words. This problem often causes no end of grief when you try out the examples on a real computer terminal.

The UNIX Programming Environment
Brian Kernighan and Rob Pike
(Prentice Hall, tk, 1984)
357 pages; softcover; $19.95
ISBN: 0-13-937699-2

The UNIX Operating System
Kaare Christian
(John Wiley & Sons, Inc., New York, 1983)
318 pages; hard cover; $26.95
ISBN: 0-471-87542-2

Kaare Christian's book, *The UNIX Operating System*, is also an intelligent and thoughtful presentation. Fans of UNIX may do well with both books on their shelves. But in most categories, *K&P* seems to edge out Christian's work.

Opposite the title page of Christian's book, for instance, you see a claim similar to *K&P*'s: "This book was prepared for phototypesetting by the author using the typesetting tools of the UNIX Operating System." Yet the text contains misspellings like "grammer," which the UNIX `spell` command should have prevented. Unlike those in *K&P*, the command examples in Christian's work are printed in a proportional font, a shortcoming which ought to have been easy to rectify with the `troff` utility. Finally, commands and key words in the text are not highlighted.

Another format problem in Christian's book is that the normally lowercase UNIX commands are at times arbitrarily altered by conventions of grammar. For example, Christian refers to the `date` command as `Date` merely because it appears at the beginning of a sentence.

Christian's writing style also has faults. He tends to coin his own terms, like *maxicomputers* or *model*, which he uses instead of the correct UNIX phrase *regular expression*. He is also too quick to generalize: for example, he says, "the memory resident part of an operating system is called the kernel." Actually, *kernel* is a UNIX-specific term.

Nonetheless, Christian is an excellent technical writer and his book is a knowledgeable, well-paced, and first-rate contribution to the popular literature on UNIX.

The UNIX Book
Mike Banahan and Andy Rutter
(John Wiley & Sons, New York, 1983)
218 pages; softcover; $16.95
ISBN: 0-471-89676-4

The UNIX Book by Banahan and Rutter must have started out as an honest effort, but good intentions are no remedy for the kind of editorial abuse this manuscript has endured. Nearly every other page contains infuriating typographical errors: Examples are often incorrect, commands rename themselves at random, and parentheses open and close with abandon.

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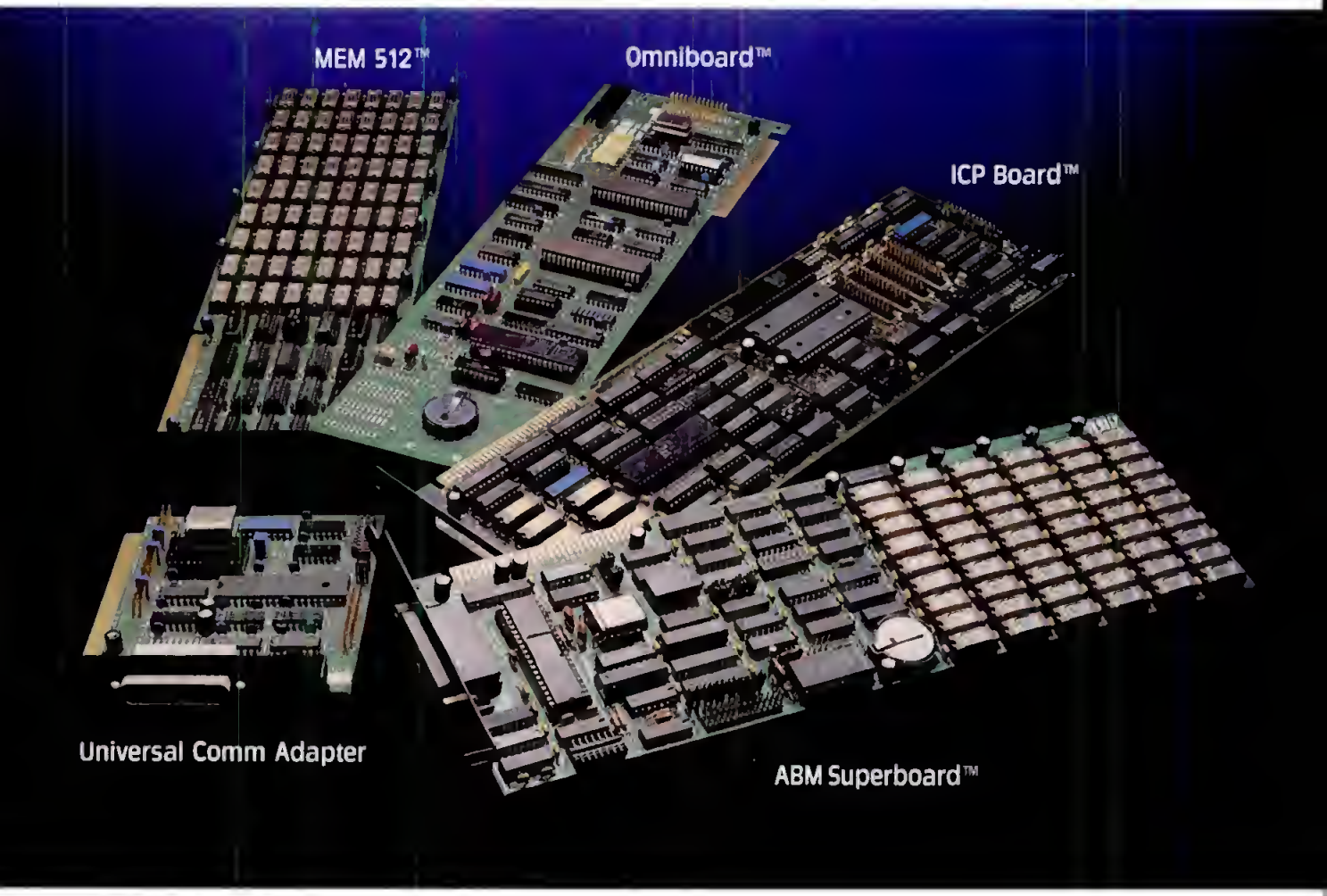

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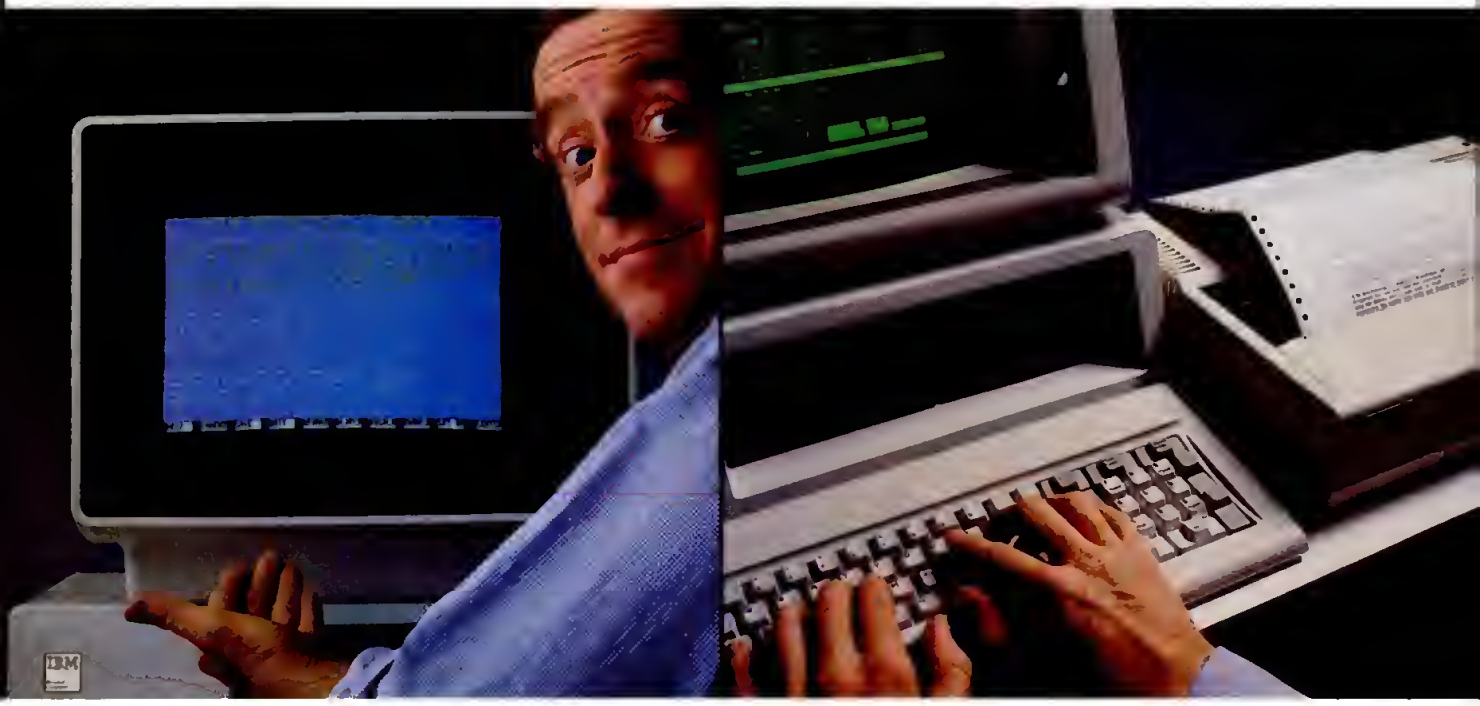

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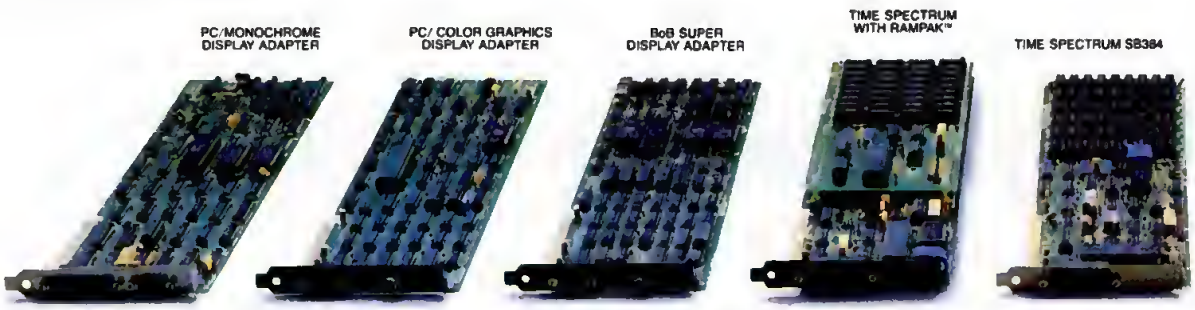

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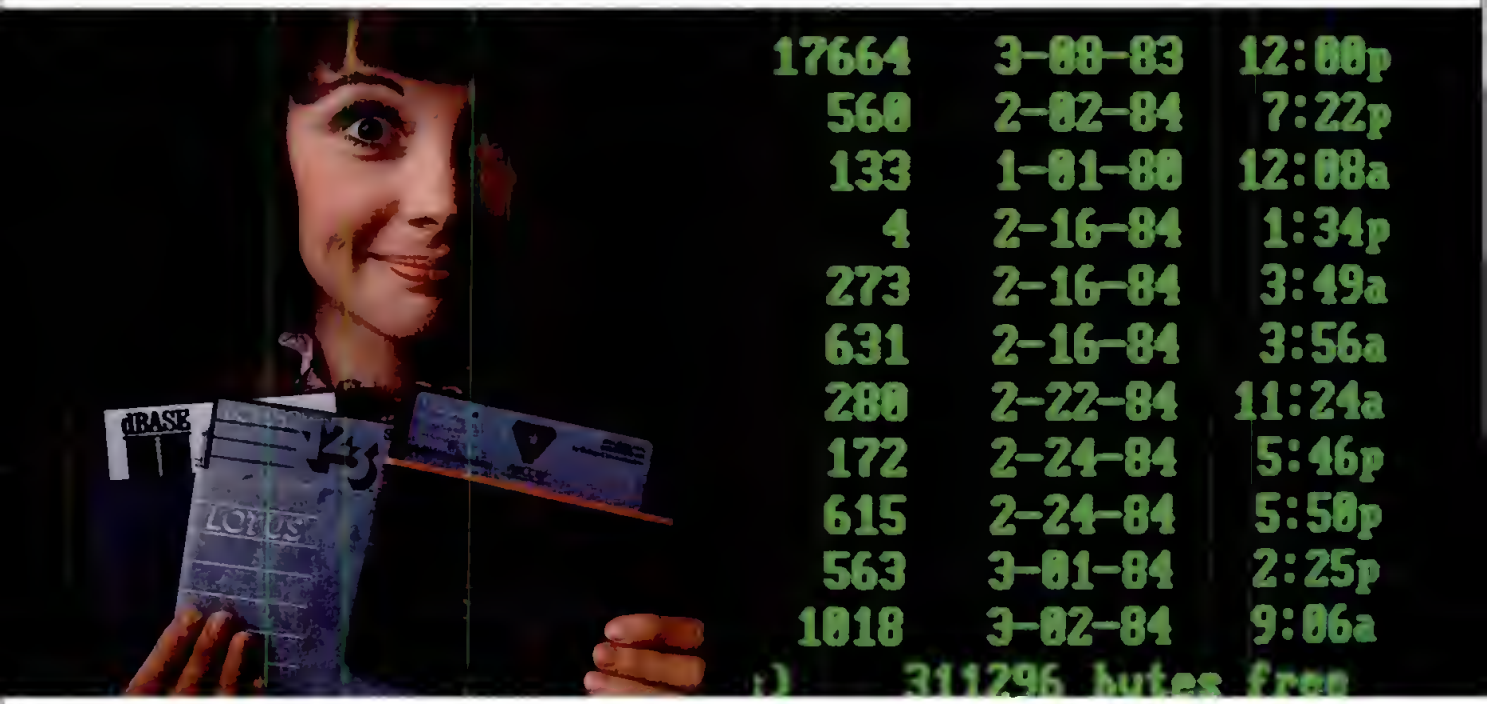

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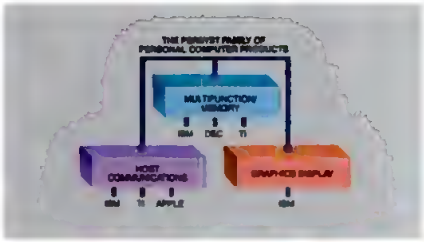

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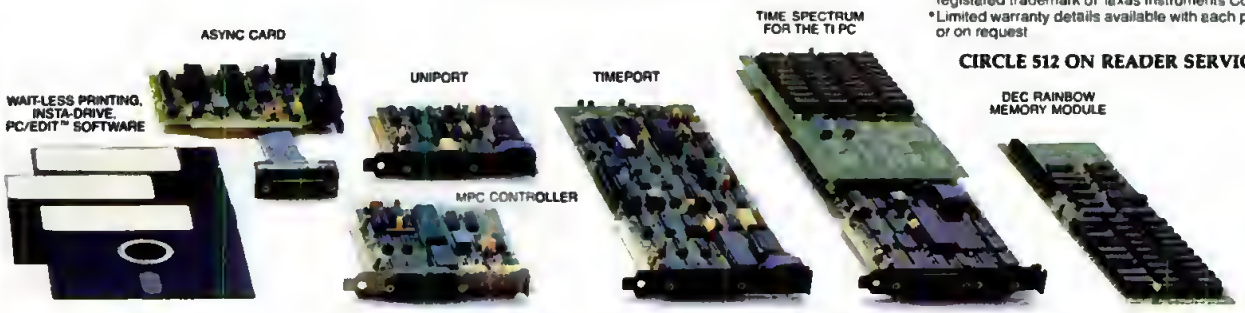

To these editorial difficulties are added the problems arising from Banahan and Rutter's British nomenclature. An experienced editor could have Americanized their expressions in a few hours.

Although I sympathize with the authors for the butchering of their work, I must also add that the work itself, though well researched, is not without fault. The authors' sense of humor, for example, is inept. They find unending hilarity in the `kill` command since it allows them to go on about "parents" killing their "children."

I compared the final chapters of these three works. *K&P* climaxes with an enormously detailed post mortem chronicling the development of a UNIX utility that Kernighan and Pike wrote, called hoc ("high-order calculator").

Christian, on the other hand, winds up with a heavy-duty section on the UNIX kernel. Since I like to get to the heart of things, I found this chapter fascinating.

Banahan and Rutter stroll off into the sunset with a chapter called "Maintenance," which tells you all about the little clerical duties that befall system operators in a UNIX shop. However, no one who has ever done this sort of work should really believe that anyone else would want to read about it.

Occasionally, the authors of *K&P* admit that UNIX has inconsistencies, but only in passing and without conviction. This approach makes it rather dry. By contrast, Christian's book is not only a good treatment of UNIX but a useful overview of operating systems in general. His discussion of the evolution of C, surprisingly, is more detailed than that in either of Kernighan's books. He digresses to give some background; *K&P* tells you only what the UNIX tools can and cannot do.

The quality of these three books is curiously analogous to their respective explanations of the derivation of the term "UNIX." Christian says "the name UNIX is a play on the word Multics." *K&P*, with greater precision, says " 'UNIX' is *not* an acronym, but a weak pun on MULTICS." Banahan and Rutter, perhaps mercifully, say nothing.

But perhaps the simplest measure of the care that went into each of these books is the size of their indexes: 129 entries for Banahan and Rutter, almost 300 for Christian, but more than 1,800 for *K&P*.

I'll take the one with the fat index. ■

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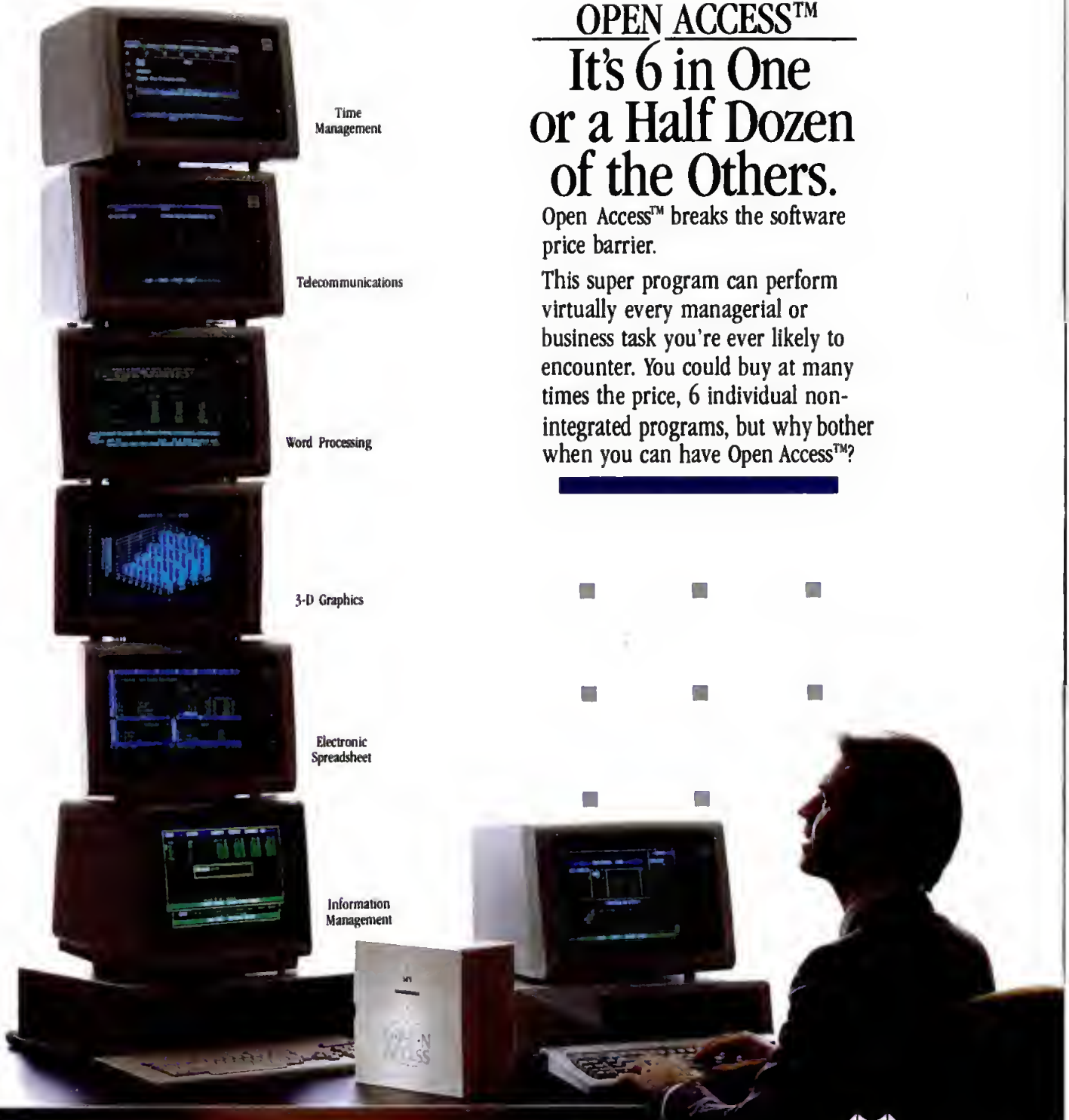

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The Complete M.D. Office Package

A PC-compatible doctor discusses the essential features that any medical office management system should have, including sophisticated payment entry, libraries, and reports.

Good software and a PC can make running a medical practice easier and more efficient. In the last issue, I discussed the important features that software used for billing purposes should have. But a basic office system needs to do more than just type insurance bills for you. You need to enter payments made, and it's nice to be able to view the information you've put into memory whenever useful in the day-to-day operation of your practice.

Ideally, payment should be made and recorded at the time your services are rendered. In reality, of course, most people don't pay cash for medical visits; they are billed or their insurance companies are. Your system needs a way to enter payments at a time other than when the charge is entered.

When entering a payment you should be sure you can credit a specific charge. You should also be able to record the source of the payment. A mechanism should be available to let you credit an account even if no payment is made—either by issuing a credit, account adjustment, or by writing off a bad debt. The system ought to keep track of all amounts in this category separately.

Patient Statements

The system should allow you to record payments and charges so that you can, at any time, give a patient a statement listing all previous transactions with you. This statement should be available both on paper (so you can give a patient proof of expenses over the entire previous year for tax purposes) and on the screen (so you can tell a patient the status of his account if called by phone). In a practice with multiple health care providers (physicians, medical assistants, and nurse-practitioners), the information should be available for each provider separately or for the group as a whole. If the system is set up to keep family accounts, the information should be available for each individual or for the entire family to give patients a full picture of their situation.

Illustration: Michael Ng

Retrieving Information

Other physicians' offices often call mine for information about my patients, usually for billing purposes. So, I like a system that allows me to call up patient biographical information by entering a name. A second screen showing insurance information is helpful. It can be combined with the patient's account information, which may be called up on a third screen.

It's convenient to be able to add missing information or correct old information while viewing these screens. You should also be able to delete a patient's record, provided there are no unresolved transactions.

Information you gather during the billing process can be useful in the management of your practice if it can be sorted and regrouped. Good software programs do permit this sorting and regrouping.

To manipulate the data effectively, you must usually collect it in appropriately named libraries containing information that can be regrouped at will. Ideally, this information should be collected by the system during day-to-day data entry without the user's intervention. In practice, most software requires the user to enter the data separately in the libraries before beginning to use the system. I have listed some of the more useful libraries.

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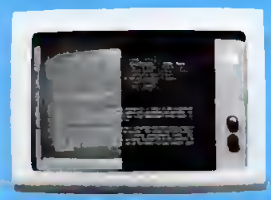

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the physicians in the practice is needed on almost any form you submit to third parties. Included in this library should be name, address, phone, specialty information, tax identification number, social security number, and provider number with each third-party payer. A three-letter mnemonic identification code should be added if the practice includes more than one provider. If needed, this code should also recall different fee schedules for each provider.

> Information you gather during the billing process can be useful in the management of your practice.

If you are part of a group practice, you must enter this information for the corporate entity as well as for each member of the group.

Referring physician library. Medicare and other third-party payers request the name of any referring physician on their forms. It's certainly helpful to you as well to know the name, address, and phone of any referral source so that you can return appropriate documentation and recommendations. If properly collected, this information can be useful in running a practice too. Many systems enable you to track the number of patients referred by a particular source and the income attributable to them. You may be surprised at the disparity between numbers of patients referred and the corresponding reimbursement. If you aren't otherwise particularly conscious of these things, you might also be surprised to learn who your friends are. A substantial number of referrals from an otherwise unrecognized source (for instance, the local Gray Panthers or Planned Parenthood) might suggest ways of enhancing your practice base.

Procedure library. As I discussed in the last issue, maintaining a library of your common medical procedures is essential. It should include an internal code for each procedure a description of it, and a standard fee. You should be able to link the internal code (preferably alpha numeric) to three or four equivalent codes so that codes on the statement will match those required by the patient's insurance company. Then your staff need not keep track of more than one code for all your patients. If the practice includes several providers, you should also be able to allow each to designate his or her own fee, which should be automatically linked to the internal procedure code to avoid error.

Diagnosis library. It's convenient to establish a list of abbreviations that represent common diagnoses so your staff can avoid typing phrases like "chronic obstructive pulmonary disease" repeatedly. The program will type out the entire phrase automatically on the printed copy, leaving no room for confusion.

Some third-party payers request that ICDA codes be used on their forms, and Medicare and Medicaid may soon require them if they begin using DRGs (diagnostically related groups) to calculate physician reimbursement. Linking these five- and six-digit codes to easily understood abbreviations will be quite a help.

Service location library. If you see patients in different offices or admit them to several different hospitals, it's convenient to keep the name, address, and any identification codes specific to the institution in a service location file. Then the information desired can be easily recalled using short, simple mnemonic codes.

Insurance company library. A short code to represent a third-party payer can be stored with the patient's insurance information. The address (for which the software should permit at least four lines), telephone number, contact, and any other necessary information can then be stored in an insurance company library. It's likely many of your patients will have the same insurance company, so it saves

space and time to use a file organized along these lines.

Reports

It's helpful to be able to list the contents of any of the libraries, alphabetically or numerically, by code or description, on screen or paper. A listing to disk could also be of use. Most medical office packages offer other reports based on data already gathered during the billing process. They include the following.

Accounts receivable. Most systems include an accounts receivable report, usually aged at 30-day intervals. The better ones allow you to exclude accounts below a specified balance and selectively report by provider, bill guarantor, third-party payer, account number, patient, and total practice.

The best systems report the year-to-date charges, balance due, from whom it is due (patient or third party), open items, date of last bill, date of last payment, from whom it was received. In these systems, the report can be restricted to a certain segment of the alphabet, group of account numbers, or dates of service, last payment, last bill, or last charge.

Daily report. This is a straightforward report listing all data generated during the day. You should be able to break the information down into groups based on location of service, type of service, and provider.

Productivity report. A good system will allow you to assess the productivity of each provider in a practice, each procedure performed, and each site at which you see patients. You can also track the frequency of particular diagnoses in your practice.

I have about covered the basic functions you need in a medical office system. Most of the systems available also offer several "bells and whistles," extras to make the package fancier. Some of these, like snow tires on a car, are worthwhile, while some have no more value than plastic wood veneer or chrome. We'll talk about them in the next column. ■

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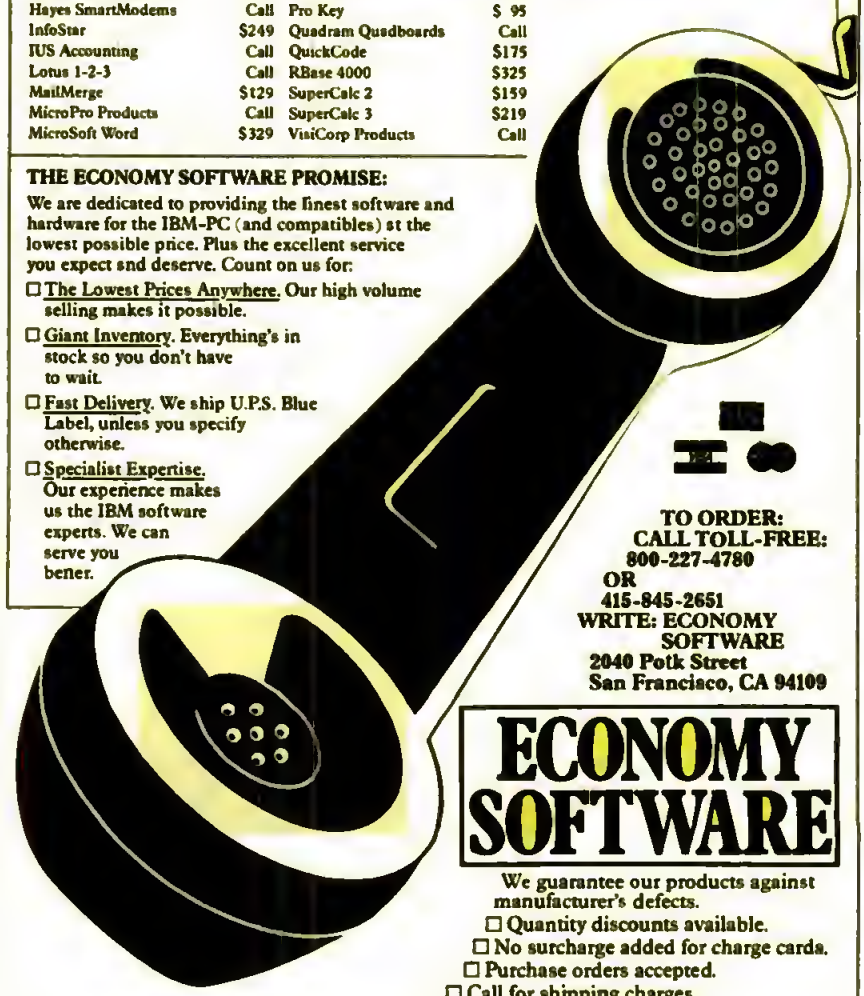

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CIRCLE 313 ON READER SERVICE CARD

ASCII to Printer Code: A Postprocessor

The BASIC program T.BAS is a postprocessor that will translate ASCII codes for specialized symbols from your word processor into your graphics printer's command language.

As I discussed in my last column (Symbolic Logic, *PC* Volume 3 Number 12), a postprocessing program will act as a translator between your word processor and graphics printer, permitting you to print special symbols of all kinds along with regular text.

One such postprocessing program is listed in Figure 1. Written in BASIC, it makes use of three files: a "font table" describing all the unusual characters in printer language, the input text file from the word processor, and an output file to be sent to the printer.

The array C$ is a list of 256 strings. In statement 210, each element of this list is set equal to a single byte whose value is its own index. If no further changes to the list were made, the program would simply create an output file identical to its input file. The program is useful because any of these 256 strings can be modified, which will translate word processor codes to printer codes or strings. Statements 240 and 250 constitute a loop that repetitively reads (from the FONT.TBL file) these special character substitutions.

Once the modifications to the array C$ are complete, the program sets up its text input and output file accesses. All the translation work is done in statement 510, which takes the ASCII value of each input byte and sends the related item on the list C$ to the output file. This translation loop terminates when it reaches the end of the input file, and the program ends.

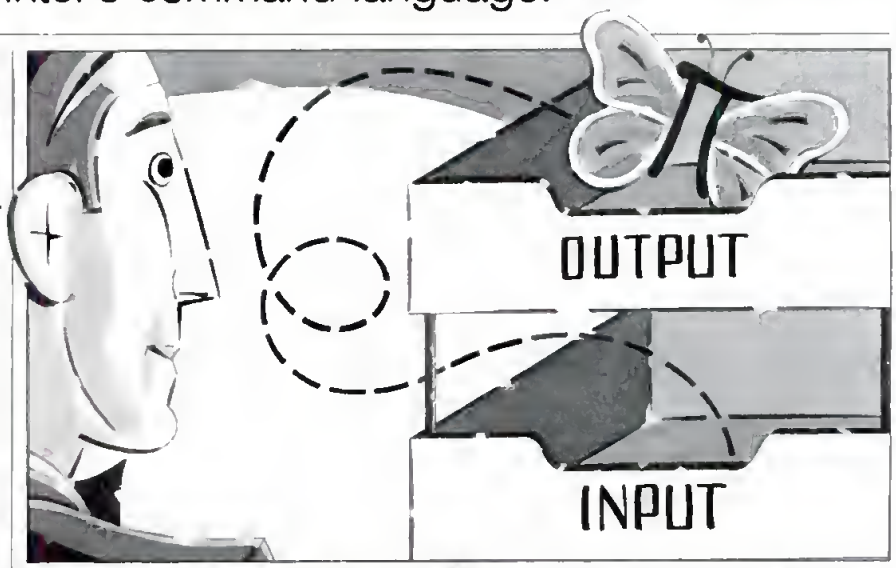

Illustration: Philip Anderson

Building the Font Table

To build this font or translation table, first make up a list of the characters that you want to be able to print. It is wise to have each new character be the same dot width as those the printer already produces so that the word processor's character counting features may continue to be used for automatic line wrapping.

Then, for each desired symbol, identify a similar or identical screen character from Appendix G of your BASIC manual and note the corresponding screen code number. Since the codes between 32 and 127 are the standard ASCII character codes, you should normally leave these alone. The goal here is to get a reasonably close correspondence between the screen character and its eventual printed form so that you can proofread on the screen without needing a cumbersome cross-reference. For many Greek letters and math symbols, this correspondence is straightforward. For others, a little artistic license is needed. For example, the mathematical similarity symbol, ≈, can be printed beautifully with the correct byte string, but on the screen I must use the tilde (Alt-126) for this function.

Each line in the FONT.TBL file must contain the index number by which the

program will look up the code and the string of bytes to be sent to the printer. That string should be enclosed in quotation marks. You type in each byte of the string (using your word processor) by holding the Alt key down, typing a one-, two-, or three-digit decimal number on the right-hand keypad, and releasing the Alt key. Use one line in the table for each character needing translation. The index numbers must be between 0 and 255, corresponding to the dimensions of the array C$ in the BASIC program and to the range of byte values generated by the word processor.

You shouldn't try constructing these new character strings until you have familiarized yourself with your printer's graphics command language. On my Integral Data Systems model 480 printer, the graphics mode is initiated by sending 1 byte that has a value of 3. Subsequent bytes in this mode are interpreted "literally"; as the printhead moves rightward over the paper, seven of the printwires are controlled in parallel by the seven least significant bits of each byte. A clean blank column of dots is represented by a code of 0. A code of 1 turns on the topmost dot, while a code of 64 turns on the bottommost dot in these seven rows. A vertical bar is represented by the binary code for all bits on, that is, 127. A byte sequence of a 3 followed by a 2 puts the printer back into its normal alphanumeric and command-control mode. Characters are normally eight columns of dots wide. Descenders are handled by painting the top part of the character using graphics mode, returning to normal mode, commanding a backspace and subscript, painting the descender using the graphics mode, and finally exiting to normal mode and moving the paper one step in the superscript direction. A nondescender character typically needs about 11 bytes. With a descender, 27 bytes are usually needed.

Other printer models will have different graphics control languages. It can be helpful to use a simple BASIC character string generator to explore your printer's performance. For example, the similarity symbol described above can be checked out with this BASIC program:

```
10 LPRINT ''Similarity
   symbol'';
   CHR$(3); CHR$(0); CHR$
   (48);
   CHR$(8); CHR$(8); CHR$
   (16);
   CHR$(32); CHR$(32); CHR
   $(24);
   CHR$(3); CHR$(2)
```

```
100 REM                                  program T.BAS
110 REM                                  printer code translator
120 REM                                  (c) Michael Lampton  1984
200 KEY OFF: CLS: DEFINT A-Z: DIM C$(255)
210 FOR I=0 TO 255: C$(I)=CHR$(I): NEXT
220 ON ERROR GOTO 777
230 OPEN "font.tbl" FOR INPUT AS #1
240 IF EOF(1) THEN CLOSE #1: GOTO 260
250 INPUT#1, I, C$(I): GOTO 240
260 PRINT ".........FONT.TBL loaded.    "
300 INPUT ".........which  drive  inputfile.ext ", INFILE$
310 ON ERROR GOTO 888
320 OPEN INFILE$ FOR INPUT AS #2
400 INPUT ".........which  drive outputfile.ext ", OUTFILE$
410 ON ERROR GOTO 999
420 OPEN OUTFILE$ FOR OUTPUT AS #3
500 IF EOF(2) THEN 600
510 PRINT #3, C$(ASC(INPUT$(1, #2))); : GOTO 500
600 PRINT ".........end of input reached."
610 PRINT ".........remember to initialize printer before printing.": SYSTEM
777 PRINT ".........missing FONT.TBL ": END
888 PRINT ".........missing "; INFILE$: END
999 PRINT ".........read/write fault.": END
```

Figure 1: *Listing of BASIC program T.BAS.*

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CIRCLE 164 ON READER SERVICE CARD

This single-statement program can quickly verify your control code sequence for the first few characters you create.

In any case, it's handy to make a grid of dots conforming to the matrix of plottable points for your printer to help you identify the possible character shapes and necessary number codes.

When the font table is completed, copy it onto a disk along with your BASIC interpreter and the program T.BAS listed in Figure 1. You can list the table directly to the printer, and the hard copy will show a column of all valid index numbers and a column of the corresponding printer symbols. Each symbol will be enclosed in quotation marks. A paper listing of this table is useful while composing at the keyboard.

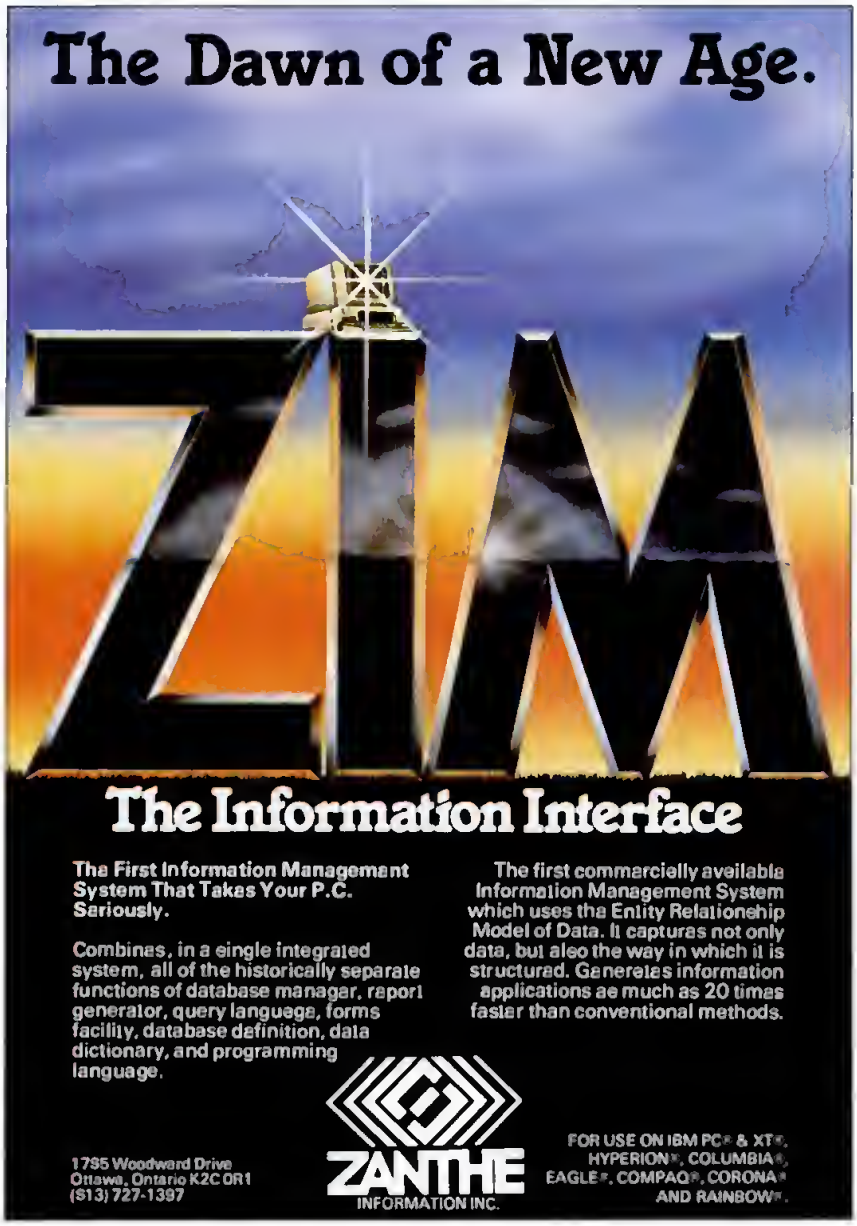
Technical word processing using the postprocessor is straightforward. While composing text, in addition to all the usual built-in characters, you can key in any of the newly created ones with the Alt key and the right-hand numeric keypad. When you finish editing, be sure to save the text file in the usual way.

While you are still in the word processor, print a copy of your file to disk. This copy can be a temporary file. The temporary file's sole use is as input for the next step. If you have a RAMdisk in operation, this file storage is one good use for it. Exit the word processor.

Now, using your postprocessor files, run the task BASICA T. After it reads the font table, the program asks you for the name of the input file, and then asks you to think up a name for its new output file. This output file can also be temporary, since its only use is to drive the printer. It cannot be conveniently edited later by the word processor since it is heavily loaded with printer format details.

The program runs slowly. You can expect to wait about 30 seconds per page. When done, the End Of Input message appears on the screen. At this point, the finished text may be printed directly by using the usual DOS commands: COPY REPORT.TPF LPT1 or else TYPE OPUS.TPF LPT1.

In summary, the program offers a useful means of preparing technical documents and printing any sort of text material requiring special symbols. It has proven effective in scientific and engineering work and can be adapted to applications in any specialized discipline. ■



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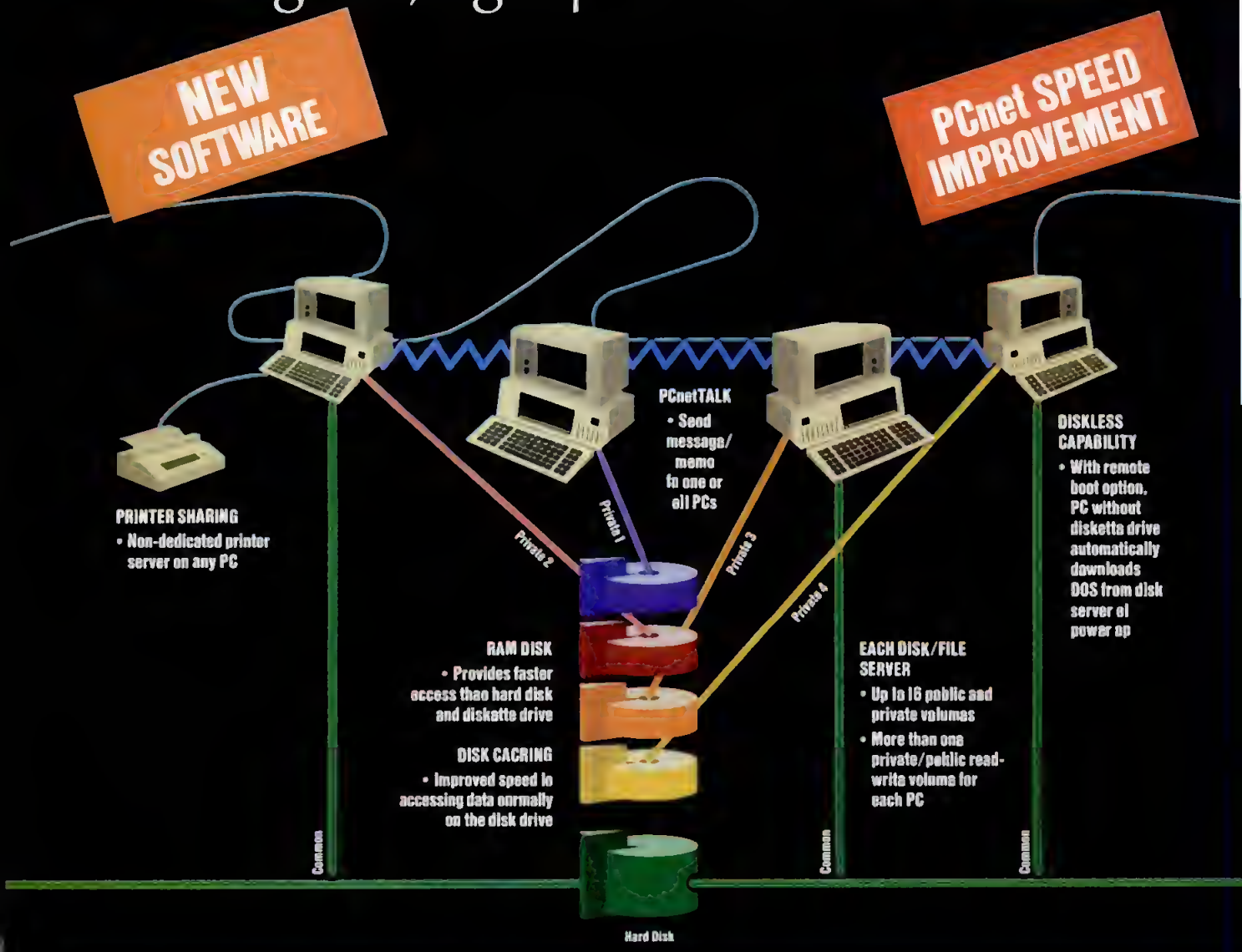

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CIRCLE 412 ON READER SERVICE CARD

Law Review

Two new books advise different strategies for lawyers contemplating computerization. One demands computer literacy, whereas the other looks for practical solutions.

Just how much does a lawyer need to know about computers before buying one?

Two new books, both by lawyers who are veteran computer users, answer that question in opposite ways. Designed to pilot lawyers through the shoals of office computerization, one is an odyssey, the other a straight shot.

Microcomputers For Lawyers, written by attorney J. Stewart Schneider and freelance writer Charles E. Bowen, lays down a formidable premise. "A happy outcome," the book says, "depends on one fact, and one fact only: computer literacy. If you feel you cannot commit the time necessary to learn about the machines before you buy one, don't buy one."

Microcomputers for Lawyers
J. Stewart Schneider and Charles E. Bowen
(TAB BOOKS, Inc., Blue Ridge Summit, PA, 1983)
120 pages; softcover; $14.50
ISBN 0-8306-0614-9

Computer Power for Your Law Office
Daniel Remer
(SYBEX Computer Books, Berkeley, CA, 1983)
142 pages; softcover; $19.95
ISBN 0-89588-109-8

The reader who can stay with the book will become quite computer literate. It covers disk controller chips and memory-to-CPU connections, followed by an explanation of the binary system and a discussion of source/object language. Before you know it, Schneider and Bowen have you following a flow chart of a law-office tickler file. Why? So you will be able to understand the structure of the 95-line tickler-file program presented in Chapter 7.

After the authors analyze the program line by line, they have a little exercise for you. Based on a more elaborate flow chart, you are to write a tickler-file information retrieval program by yourself.

The authors reveal their own 125-line version for comparison. "How did you do?" they ask. "Did your program manage to get the records off CALENDAR/DAT and onto TEMP/DAT, and then to the printer? If so, buddy, have a drink!"

A drink? Merciful thunder! Have nine kegs of prize-vintage French Burgundy, a new Mercedes, and a contract from Ashton-Tate! Buddy, you have done—without touching a computer—what many a novice hacker with $6,000 worth of machinery has given up on. You might as well discard your Bar license, since your future probably lies in computer programming, not in the practice of law.

The writers insist they are not trying to turn you into a programmer. "You shouldn't take from this material any programming tricks, only a general understanding of how a flow chart is translated into a program and the way the computer goes about solving the problems given it." This understanding is necessary, they go on to explain, so you will know precisely what to expect from a computer and won't be frightened or disappointed by it.

My own contention is that the typical lawyer will not spend time learning the nitty-gritty of computers—and doesn't need to. All the average lawyer cares to know is how to turn the machine on and off, boot up a disk, and run *WordStar* or *dBASE II*. Learning the whys and wherefores of a computer program is no more

Illustration: Michael Ng

necessary for a lawyer than learning what makes a typewriter letter strike forward when the key is pressed.

A Practical Approach

Computer Power for Your Law Office, by Daniel Remer, takes a more straightforward, practical approach. Remer assumes what the lawyer in the market for a computer really wants to know is how the computer can streamline a practice. Remer methodically covers all the bases: word processing, databases, electronic worksheets, general accounting, and legal-specific programs with an appropriately heavy emphasis on timekeeping and billing requirements.

Almost every option, you learn from Remer, has advantages and disadvantages. Beginning with the first choice—standalone word processor versus microcomputer—he provides pros and cons at each step. He arms you with specific features to look for and specific questions to ask. He explains why certain factors are crucial for some practices but can be safely overlooked by others.

Remer is a staunch believer in law office computerization, but he urges you to carefully scrutinize every potential application. He points out that law-office accounting may not be something that should be computerized. He attempts to explain the reasons why or why not, depending on the particular situation.

Rather than teach you BASIC programming, Remer devotes a sizable portion of his book to the illustration of a law-office financial model. He gives you a taste of the commands you'll have to learn to operate a spreadsheet, but he does not overwhelm you with computer manualese. Always careful to see the big picture, his emphasis is on strategy rather than tactics: "One of the main benefits of electronic worksheets is that they allow you to focus on the right questions," he writes.

Remer's book contains prudent advice at every turn. "Buy now," he recommends. Your object shouldn't be to wait for "the best," he says, because, given daily improvements in both hardware and software, the best will never come. Instead, seek a machine and programs that can solve a specific set of legal office problems. When you find them, buy them and put them to work.

Yet while Remer condemns dallying, he does emphasize caution. Even legal-specific software can breed problems, he warns, pointing out that legal programs are often developed for a specific law firm, then are placed on the market "as an

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afterthought." The result can be "an inflexible and relatively untested system complete with a poorly written user manual." How true—not just of legal programming, but of any custom program.

Remer discusses the pitfalls of incompatibility, the evolution of prepackaged software, and recommended memory-capacity minimums for law offices. He shows, with illustrations, exactly what it's like to log onto The Source and suggests how lawyers can use such database services. This is precisely the kind of information most lawyers will want when computerizing their offices.

Comparison

Both books set about their separate tasks seriously, without whimsy, but both relieve the reader with timely humor. Both include hypothetical law office examples to accompany the discussions. Remer's examples are more realistic, while Schneider and Bowen tend to go to extremes to make a point.

You can learn something useful from both of these books. I believe Remer offers the information you need most, if you are on the outside looking in. His book is concise, objective, and complete. *Computer Power for Your Law Office* presents computer illiterate lawyers with, if nothing else, an important checklist to follow in selecting software and hardware. *Microcomputers for Lawyers*, despite its stated intent, is more suited to lawyers already committed to computerization who want to learn how to write legal programs. In fact, its chapters on flow charting and writing the tickler programs comprise the best applied, legal-specific, programming instructional I've seen. If you can compose the program the authors expect you to, you have acquired knowledge transcending ordinary computer usage.

On the other hand, Schneider and Bowen's notion that computers must be intimately understood, somewhat like mentally disturbed co-workers, appears lame.

One of the first things a lawyer contemplating the computerization of his office should do is to consult other lawyers who have traveled the hi-tech road. Books such as these two are an easy and effective way to do just that. But as the differences between them indicate, don't expect to receive standard advice. ■

Robert P. Wilkins is a lawyer and the editor of The Lawyer's PC, *a newsletter for lawyers using the IBM PC. Send inquiries to P.O. Box 1108, Lexington, South Carolina 29072.*

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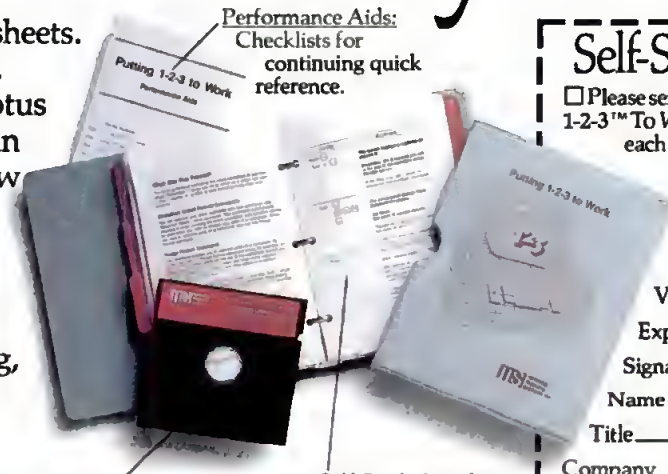

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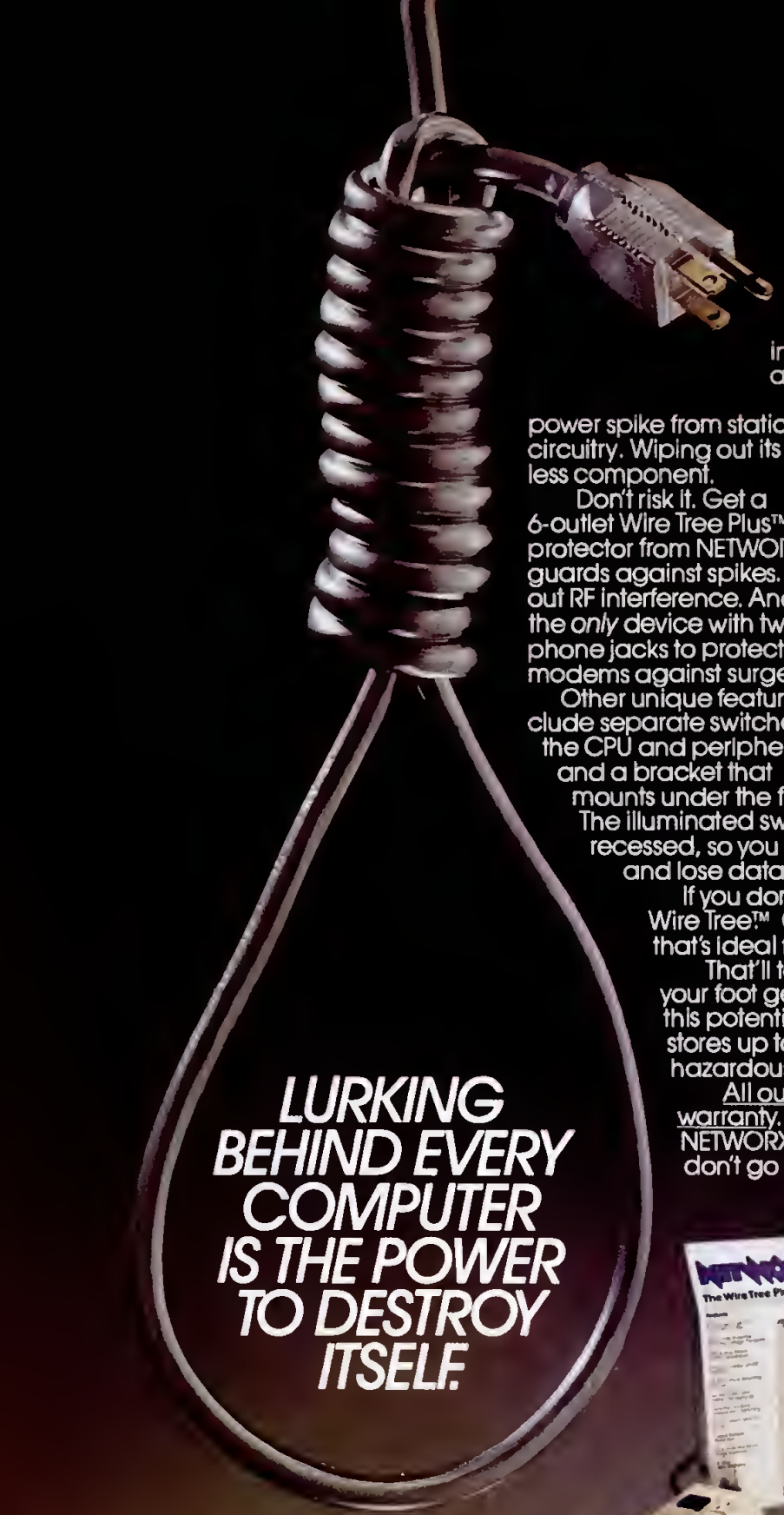

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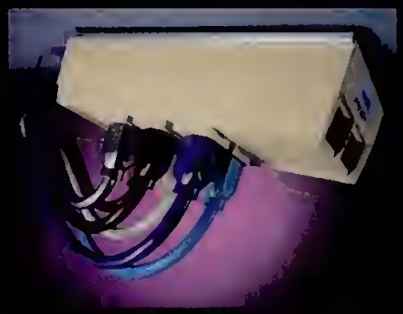

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PC Flight Planner

The Official Airline Guide, Electronic Edition, is an on-line database that helps you wend your way through the maze of flights and fares to find the fastest and cheapest.

Illustration: Philip Anderson

Airline deregulation has left a tangle of fares and flights that seem to change almost daily. To find the right flight and fare, business travelers must make long telephone calls to travel agents or airline representatives. What if all necessary flight information could be accessed easily, quickly, and cheaply on your personal computer?

With a new on-line version of the well-known *Official Airline Guide, Electronic Edition (OAG EE)*, published by a division of Dun & Bradstreet, you can plan your own flights in minutes. All that's required is a PC, with modem, a subscription to the service, and a few minutes available to spend with the software's clear, concise documentation.

The *Official Airline Guide, Electronic Edition*, gives you on-line access to domestic air fares (which are revised daily) and national and international schedules (which are revised weekly) for more than 700,000 flights and 650 airlines. You may subscribe directly to *OAG EE* or access it through another on-line database, such as Dow Jones News/Retrieval service.

OAG EE is flexible enough to be convenient for both beginning and advanced users. A beginner is prompted step-by-step through a "dialog" to retrieve flight schedules. An experienced user can bypass the on-screen prompts and get the same information with a single-line command:

```
/s rdu;ord 5 apr
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You can also retrieve fares by an easily remembered single-letter command: /f. Fares are routinely listed beginning with the lowest.

The asterisks on the screen listing fares show that the lower fares have limitations attached to them; you enter /l to view the conditions that must be met. In most cases, tickets must be purchased so many days in advance or travelers must fly on certain days.

More detailed information is also available through the expanded fare command:

```
x line-number
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in which "line-number" is the line on the fare screen that you want expanded. These entries spell out airline abbreviations, indicate the flight class, and list other useful information. An expanded entry for a Raleigh to Champaign, Illinois, flight appears as follows:

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Help and Security

Unlike some on-line databases, *OAG EE* never leaves you hanging or bewildered. At any point in the dialog, you may enter a question mark and appropriate help comments will appear. Such finely tailored on-line help contributes to *OAG EE*'s ease of use.

The next logical commands also appear at the bottom of each data screen. By entering the /u command, the user moves to the User Comments and Suggestion Box option to enter queries on-line. An *OAGEE* representative replies to these queries by telephone.

For flights originating in North America, the *OAG EE* schedules are remarkably complete. All you have to know is your final destination. Let's say that you are attending a business conference in St. Louis, Michigan. Entering "St. Louis" after the destination prompt brings a request for more specific information: St. Louis is the name of four American cities. The database includes more than 100,000 pairs of cities. Virtually any destination may be located, as long as it has a population of at least 2,000, in North America or 5,000 in Europe. If the destination you've selected has no airport, the program gives you the location and distance of the nearest airports.

Raiders who illicitly access data files have made everyone who uses on-line information services more security conscious. *OAG EE*'s main measure against illicit use is user password security. Multiple users are individually billed for both security and accounting reasons. Ultimately, account security depends on the care you exercise.

Cost

OAG EE offers a 30-day free trial. A one-time $50 subscription fee is then levied if you opt to continue service.

On-line charges are figured in terms of "units," valued at 10 cents each. Each minute of connect-time equals one unit, a charge equal to $6 per hour. In addition, each screen of up to six flight schedules is billed at 2 units, and each screen of fares at 3 units. By entering single-line multiple commands, a user can retrieve flight and fare information in fewer than 5 minutes for a total cost of less than a dollar.

While comprehensive, *OAG EE* is not complete. A request for an international schedule was filled promptly. A request for return flights, however, brought a misleading message that suggested that the requested route wasn't serviced at all.

What it really meant is that no flight is scheduled for the specific date requested. When you encounter such a message, you should try other dates to determine whether service exists. A list of days of the week on which flights are available would be a welcome addition.

Current fare information covers North American flights only. The *OAG EE* subscriber cannot book reservations directly. But armed with specific flight numbers, times, and fares, the user saves a great deal of telephone time with travel agents or airline representatives. ■

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Richard W. Slatta is a writer and historian living in Raleigh, North Carolina. He specializes in telecommunications and educational applications of microcomputers.

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CIRCLE 202 ON READER SERVICE CARD

New On The Market

HARDWARE

Tandberg Cassette Recorders

Two plug-compatible audio cassette recorders that provide random-access audio in response to software commands from the user's system. The Tandberg TAL 812 and 822 recorders can output audio recordings stored on standard cassette tapes as adjuncts to an application, permitting aural reinforcement of screen displays. Any portion of a tape can be accessed by computer command within seconds, in any order requested by software.

The TAL 812 model is a two-track recorder designed for use with headphones only. The 822 model includes an amplifier and speaker. Both models incorporate 8048 microprocessors that accept ASCII command strings terminating in LF/CR, at baud rates from 150 to 9600 in half duplex operation. Both interface to the user's system via a standard RS-232 connector.

Other features of the recorders include dual capstan closed-loop tape transport, signal-to-noise ratios of 58 dB, and usable frequency ranges from 40 Hz to 14KHz ± 3 dB.

(List Price: Either model $1,253)

Tandberg of America, Inc.
Labriola Ct.
P.O. Box 58
Armonk, NY 10504
(914) 273-9150
Telex: 13 7357

CIRCLE 797 ON READER SERVICE CARD

Cygnus Board, Titan Technologies, Inc.

Cygnus Board

A half-size plug-in board for the IBM-PC or PC-XT providing a clock/calendar, a game controller interface, and a choice of serial or parallel printer ports. The board, designed to fit in the short slots of the PC-XT, includes a lithium battery for the clock/calendar function, as well as support software that automatically supplies the correct date and time to the user's system when booting up. The game controller port of the Cygnus card can accept any joystick that is compatible with IBM's game adapter.

The board is available in two versions: the Cygnus-S1 provides an asynchronous serial communications port that can accept a range of serial devices. The Cygnus-P1 features a bidirectional parallel port that can output data to a printer or other peripheral device or act as an 8-bit input port.

(List Price: serial model $299; parallel model $199)

Titan Technologies, Inc.
310 W. Ann St.
Ann Arbor, MI 48104
(313) 662-8542

CIRCLE 798 ON READER SERVICE CARD

TAXAN Monochrome Monitors

Two monochrome monitors that are directly plug-compatible with the IBM-PC because of built-in TTL signal input circuitry. Both monitors operate over a 20 MHz bandwidth for clear images, horizontal/vertical position and hold, and vertical linearity. Using the 635R CRT tube, both monitors feature flat screens.

Model 121 offers a green screen, while Model 122 screen is amber. Both make use of slow-persistence phosphor to minimize screen flicker.

(List Price: Model 121, $219.95; Model 122, $229.95)

Taxan Corp.
18005 Cortney Ct.
City of Industry, CA 91748
(818) 810-1291

CIRCLE 796 ON READER SERVICE CARD

StorageMaster 500 Series

Two 5.25-inch Winchester drives with either 18 or 30 megabytes of formatted storage capacity. Each of the stand-alone Winchester subsystems includes the drive, power supply, and fan housed in a single cabinet. A single-board drive controller is supplied that takes up one slot within the user's system.

(List Price: 18 MB $2,495; 30 MB $3,390)

Control Data Corp.
220 Berkshire Ln. N.
Plymouth, MN 55441
(612) 853-3276

CIRCLE 790 ON READER SERVICE CARD

Colby KEY-2 Keyboard, Colby Computer

Colby KEY-2 Keyboard

A replacement keyboard compact and light enough to sit comfortably on a lap. The Colby keyboard is 15 inches wide (4 inches narrower than the standard PC keyboard), and is constructed with a die-cast magnesium frame. Function keys are arrayed across the top of the board, permitting access by either hand. Shift keys are in the IBM Selectric Typewriter positions, and built-in LEDs on the NumLock and CapsLock keys indicate the status of those keys at all times. In addition, the keyboard features separate cursor control keys and a numeric keypad.

(List Price: $259)
Colby Computer
849 Independence Ave.
Mountain View, CA 94043
(415) 968-1410

CIRCLE 792 ON READER SERVICE CARD

XTender

A multiterminal system for the IBM PC-XT, permitting up to five terminals to use the resources of a host PC-XT. The XTender system consists of a single plug-in board incorporating four serial ports and both an Intel 80186 and an 80286 microprocessor, which work with the PC-XT's 8088 chip to manage multi-user and multitasking functions. PC-DOS programs can run without modification. The same application program can be run on all five terminals at once, or different applications can operate simultaneously.

The XTender board also features a 16-bit data bus that speeds access to data files by the installed terminals. Two RAM memory options are available for the system, for either 512K or 1,024K of RAM available to all terminals. Using standard serial connectors, data can be transferred between the PC-XT and a wide range of terminal types at rates up to 19,200 baud.

Software included with the system handles all disk management tasks, creating a buffer from the PC-XT's 128K built-in RAM to speed data access. In addition, provisions within the system permit PC-DOS and CP/M-86 applications to be run as individual jobs under the umbrella of the XTender's operating system.

(List Price: $3,995)
PC Technologies Inc.
738 Airport Blvd., Box 2090
Ann Arbor, MI 48106
(313) 996-9690

CIRCLE 793 ON READER SERVICE CARD

S/COM 3400 Streamer

A ½-inch streaming tape subsystem offering 34 megabytes of backup storage capacity. The unit features automatic front loading of tape reels. Throughout all operations, the unit's front panel displays its status; 99 separate diagnostic tests can be performed on the unit from the front panel.

The 3400 Streamer records on a standard ½-inch open-reel tape in IBM/ANSI/ECMA compatible format. Units are available that record at either 1600 bits/inch or 3200 bits/inch, at tape speeds of 25 or 100 inches per second.

(List Price: 1660 bpi $5,295; 3200 bpi $5,995)
Science & Communications, Inc.
352A University Ave.
Westwood, MA 02090
(617) 461-0200
Telex: 92 4473

CIRCLE 795 ON READER SERVICE CARD

PC 100 Prototype Board

A circuit design board configured to fit an expansion slot in the IBM PC. The board provides wire wrap pins, and can accept integrated chips and circuit components with .300, .600, and .900 pin centers. Also provided are 60 I/O holes for right angle d-sub-miniature connectors. For additional circuit capacity, plug-in piggyback prototyping boards are available in four lengths. A full-size layout sheet is included to sim-

plify component placement.

Options available for the PC 100 board include capacitors, connectors, battery holder, mounting brackets, and other components.
(List Price: PC 100 board only, $59)
Intercon Inc.
11 Charlam Dr.
Braintree, MA 02184
(617) 848-9656

CIRCLE 791 ON READER SERVICE CARD

SOFTWARE

Cubicomp CS-5/ Easel Combination

A computer-assisted-design package consisting of *CS-5*, a three-dimensional precision drafting program, and the *Easel* free-form graphics program, which offers a range of on-screen painting, broad color palette, and special-effect graphics features.

The Cubicomp *CS-5* CAD system consists of a graphics display generator with interface and cabling, and solid-model generating software. It enables the user to create and manipulate full-color 3-D models, in either wireframe or solid images. At any stage in the development of a model, the image can be reduced, enlarged, moved, duplicated, rotated, and stored to disk. Surface shadings can be added to solid models and two separate image planes are offered, permitting the user to alternate between two models. This feature allows one model to be displayed while the second image is being drawn.

The CS-5-compatible version of the *Easel* program permits the user to choose, from a palette of 16.8 million possible colors, a spectrum of up to 4096 simultaneously-displayable colors. Using a digitizing tablet and wand, the user can create free-form images in a variety of brushstrokes, from fine lines to heavy brushes or puffy airbrush-like effects. A series of menus, each containing about a dozen commands, offer a range of display, coloring, shape-generating, and special effects.
(List Price: CS-5 $9,700; SC-5-compatible Easel program $2,450)
Requires: 500K RAM, one disk drive, PC-DOS, 8087 Co-Processor Chip.
Cubicomp Corp.
3165 Adeline St.
Berkeley, CA 94703
(415) 540-5733

CIRCLE 789 ON READER SERVICE CARD

CERTIFIED Accounting System

An integrated accounting software package, consisting of separate modules for the five basic accounting functions. The modules—*General Ledger, Accounts Payable, Accounts Receivable, Inventory,* and *Payroll,* plus a separate required *System Guide*—are available separately, and are designed for first-time users. All modules are available with or without the ability to automatically update the *General Ledger* module.

The *CERTIFIED* software was developed using a database management system/program generator, providing the user with the ability to tailor the software to specific needs. Areas that can be customized to an application include data entry screens, which can match a user's existing business forms; field lengths and types; and report formats, in addition to those supplied preformatted.

The accounting programs permit records to be kept in accordance with Generally Accepted Accounting Standards (GAAS), with audit trails and internal processing controls.
(List Price: Modules without General Ledger Updating, $195 each; Guide $45)
Requires: 128K RAM, two 320K drives, PC-DOS.
Certified Software, Inc.
9900 SW Wilshire St.
Portland, OR 97225
(503) 297-8666

CIRCLE 788 ON READER SERVICE CARD

***CERTIFIED Accounting System,** Certified Software, Inc.*

Forbidden Quest, Pryority Software

Forbidden Quest

An adventure game program using prose and five original comic-art prints depicting different locations and situations encountered within the game. The art prints hold clues to successfully attaining the goals of *Forbidden Quest*. The prints provide accomplished, as well as novice, players with an opportunity to practice new game skills. Over 100 locations, on three fictional planets, are included in the game.

Forbidden Quest makes use of dedicated function keys, and a keyboard template is provided for easy reference. Although the game diskette is copy-protected, backup copies can be made. Should a crash occur on the main program disk, the backup can be copied back to the original disk and run without problems.

(List Price: $39.95)
Requires: 96K RAM, one disk drive, PC-DOS.
Pryority Software Inc.
P.O. Box 221959
Carmel, CA 93922
(408) 625-0125

CIRCLE 756 ON READER SERVICE CARD

DMS-III

A menu-driven database management program capable of performing complex spreadsheet-like calculations. The software also incorporates a free-form reporting capability, allowing the user to custom-design report formats, including checks and invoices.

DMS-III does not require the user to learn a complex programming language, as its menus adapt to virtually any file and form requirements. The software automatically creates menus and databases as needed. The program is written in compiled MBASIC, with assembly language sort routines. Each database file created with *DMS-III* can support up to 32,000 records, with up to 60 fields per record.
(List Price: $295)
Requires: 64K RAM, two 320K disk drives, PC-DOS.
Microline, Inc.
1701 W. Front St.
Tyler, TX 75702
(214) 592-3778

CIRCLE 755 ON READER SERVICE CARD

A.K.A. Alias Utilities

A set of utility programs that provide extended directory/subdirectory search capabilities for PC-DOS 2.0. *A.K.A. Alias* permits applications programs and editors to access files outside of the current default directory; path names are not required for the application to find its supporting files, regardless of its actual subdirectory location.

With the utilities, the user can create a new subdirectory, format a new diskette for immediate use, or create small batch files to access applications program components scattered throughout several PC-DOS 2.0 directories.
(List Price: $60)
Requires: 64K RAM, one disk drive, hard disk, PC-DOS 2.0.
Soft Shell Technology
54 Walnut Hill Rd.
Newton, MA 02159
(617) 332-6817

CIRCLE 754 ON READER SERVICE CARD

DMS-III, Microline, Inc.

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CIRCLE 224 ON READER SERVICE CARD

Video Shop Software

A menu-driven program for retail video shops that can keep track of movie inventories, print invoices for rentals or sales, and handle a shop's membership rolls. *Video Shop* also generates several reports to aid in inventory control and security. It not only lists movies in stock by formats available, but also provides statistical reports on inventory and customers. A nightly report can be printed showing that day's activity, and mailing labels can be produced for all customers or for selected mailings.

The software includes the ability to maintain a depreciation schedule for shops wishing to sell their movies. Other features include reservations management, giving the operator a warning signal if the same tape has been reserved twice for the same time period; due back dates on checked out items; and, if desired, the program allows for a free rental with every X number of movies rented by a customer.

(List Price: $750; demo $50)
Requires: 256K RAM, two disk drives, PC-DOS 2.0.
Streamlined Information Systems
Media-Ware Div.
1117 E. Country Hills Dr.
Ogden, UT 84403
(801) 479-0320

CIRCLE 736 ON READER SERVICE CARD

***Personal Financial Software**, Prentice-Hall*

Personal Financial Software

Two programs for personal financial planning, incorporating simple English commands, full-screen editing, and a choice of numerical data input types.

The Personal Financial Planner offers the user nine major functions for charting investment strategies, insurance needs analysis, tax planning, future financial requirements, estate planning, cash flow analysis, net worth statements, and personal data.

The Personal Financial Manager offers eight functions for money management: maintenance of income/expenses, bank and credit card accounts, automatic check writing, assets/liabilities inventory, net worth statements, income/expense statements, budget tracking, tax transactions, and miscellaneous reports.

(List Price: $200 each)
Requires: 128K RAM, two disk drives, PC-DOS.
Lumen Systems, Inc.
Prentice-Hall
Englewood Cliffs, NJ 07632
(201) 592-3027

CIRCLE 787 ON READER SERVICE CARD

SECURITY

A program providing password and user-defined code protection for software. *SECURITY* does not affect the normal operations of programs in use, and it does not require modifications to either the user's software or equipment.

(List Price: $50; demo disk, $25)
Requires: 64K RAM, one disk drive, PC-DOS.
The ANSWER in COMPUTERS
6035 University Ave., #7
San Diego, CA 92115
(619) 287-0795

CIRCLE 740 ON READER SERVICE CARD

RamDisk II

An electronically emulated disk drive, capable of using up to 180K RAM as file storage space. The software operates transparently, without requiring that the user learn complex command procedures before using the RAMdisk, and without requiring special hardware.

The *RamDisk II* diskette also includes *RC Spooler*, a multiple port print buffer that allows the user to spool copy for up to four printers simultaneously. *RC Spooler* has a user-definable buffer size of up to 63K RAM and can support both parallel and serial printers in any combinations. The spooling utility allows cancellation of an ongoing printing operation and can operate in the background, freeing the user's system for other tasks.

(List Price: $59.95)
Requires: 256K RAM, two disk drives, PC-DOS 2.0.
Rensin Communications
P.O. Box 414
College Park, MD 20740
(202) 728-7955

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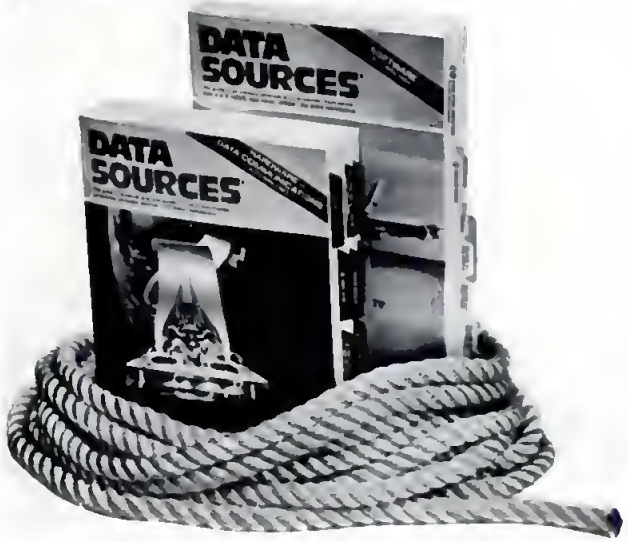

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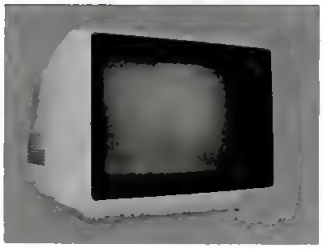

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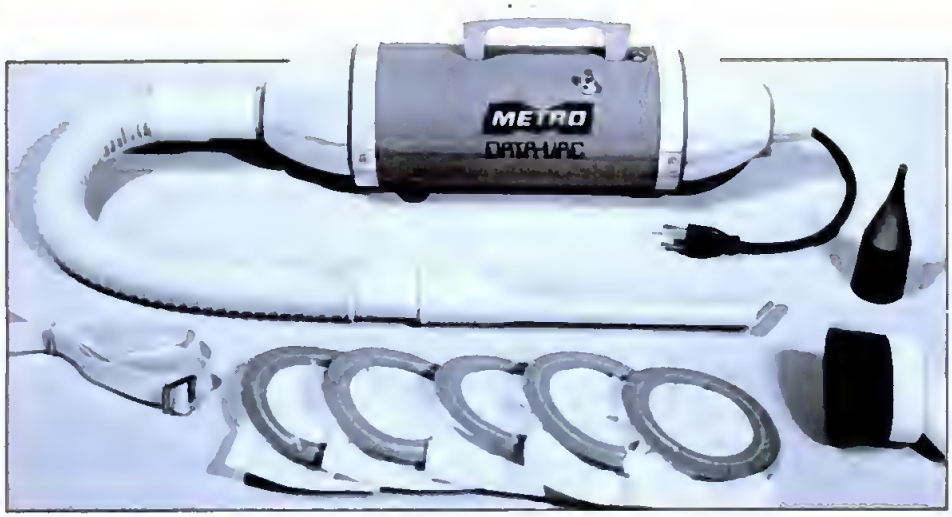

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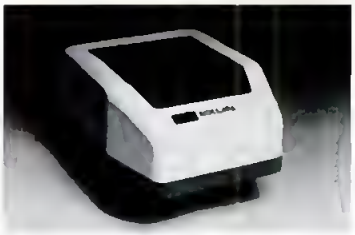

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2. Releases should be typewritten double-spaced on one side of the paper. Copies of advertisements for the product may be included, but in most instances we need more information about a product than is typically included in an ad.

3. Include telephone contacts for marketing and technical questions.

4. If available, include black & white glossy photos of the product, 4 5 in. or larger.

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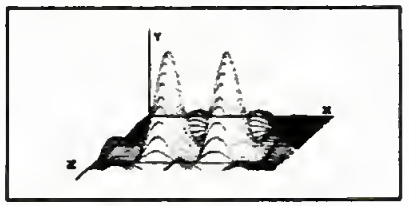

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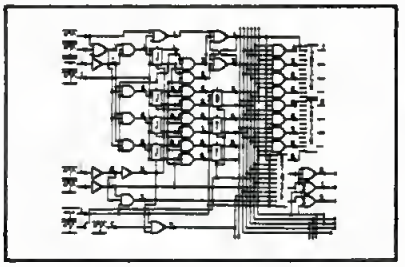

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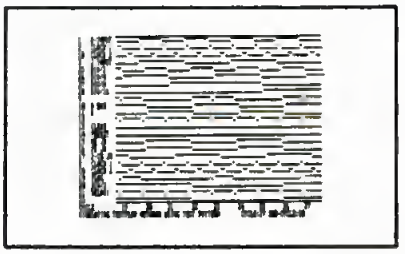

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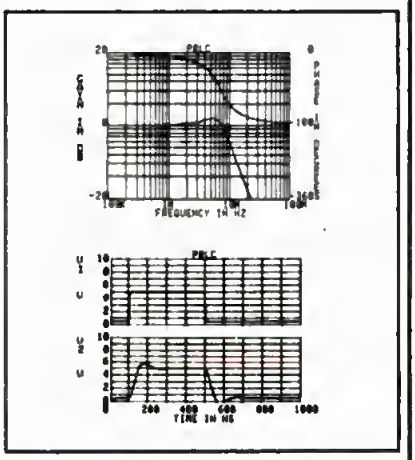

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User Group Profile: A Capital Survey

The Capital PC User Group, one of the largest in the country with 2,500 members, recently surveyed its members to learn about their identities, interests, and concerns.

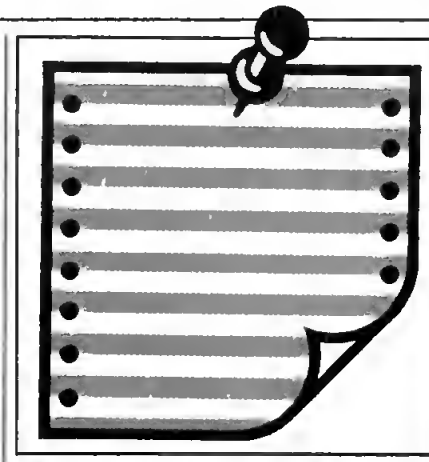
Early in 1982, a handful of IBM PC owners in the Washington D.C. area formed the Capital PC User Group (CPCUG). Two years and many growing pains later, CPCUG is a nonprofit association of over 2,500 PC users.

With a 50-page, professionally published monthly newsletter, over 20 special interest groups—covering languages, applications, communications, finance, statistics, and other areas—and over 15 electronic bulletin board systems, CPCUG is one of the most active PC user groups in the country.

CPCUG's two monthly meetings—one for each of the group's two regional divisions—follow a well-planned schedule. From 7–8 p.m., a panel of 4 or 5 knowledgeable volunteers answers questions submitted by the audience. Outside the meeting room, other volunteers sell copies of the Capitol PC Public Domain Software Library's diskette-of-the-month. At 8 p.m. there are software demonstrations presented by members or by the vendors. After about an hour of demonstrations, members break up into their special interest group meetings for the rest of the evening.

A User Group Survey

CPCUG surveyed members who attended its January meetings in order to find out about members' concerns, interests, and demographic characteristics. Nearly 400 members responded to the questionnaire.



One of the survey questions asked members why they attend the CPCUG meetings (Figure 1). Together, the two monthly meetings usually attract from 500 to 700 members. The two reasons most frequently chosen by the survey respondents were "to see product demonstrations" (37%), and "to participate in the question-and-answer session" (23%). These answers highlight the main reason user groups form: to provide a forum for learning about personal computers.

Not surprisingly, the survey found that most of the CPCUG members use bona-fide IBM PCs (70%) or PC-XTs (17%). On the other hand, there is a sizable contingent (11%) of PC-compatible users among the membership. In fact, CPCUG has formed a special interest group for members who own machines such as the Compaq, Columbia, and other IBM PC compatibles. The group helps answer questions about what software will run on these machines.

The questionnaire also gathered general information about members' equipment (Figure 2). Almost 90 percent of the members have double-sided floppy disk drives, and over 70 percent have 256K or more of system memory. Nearly a quarter of the members surveyed have hard disks of some kind, and just over half have color or graphics displays.

Half of the respondents have telecommunications equipment for their PCs, a finding reflected by the tremendous amount of activity on CPCUG's electronic bulletin boards. These bulletin boards focus on a variety of topics, including BASIC, C, and UNIX, Statistics, Telecommunications, Cryptography, and even Philosophy and Religion. In addition, articles for the monthly newsletter are uploaded to the editor's PC using one of these bulletin board systems.

Nearly 40 percent of CPCUG's members still use DOS 1.1 for their PCs, and there are even a few who are still using version 1.0. A majority (54%), however, run their machines with DOS 2.0. In fact, less than one percent of the respondents

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CLUB NEWS

reported using operating systems other than those in the IBM DOS family.

Who Are They?

CPCUG's members include many who do not own a personal computer but use one at work. Additionally, there are numerous individual entrepreneurs with part-time businesses related to the PC, and the survey revealed that nearly half of CPCUG members use their computers to generate income.

Nearly all CPCUG members have college degrees, with well over half holding advanced degrees. The median annual income for the respondents is $45,000. Half of the members are 39 years of age or older, and eleven percent of CPCUG's members are women.

Among the many professions represented in CPCUG, only 31 percent are directly related to the data processing industry. Twelve percent of members work in the engineering professions, and 8 percent are scientists of some kind, mostly chemists and physicists. There are also consultants (7 percent), financial specialists (5 percent), and physicians (4 percent) among the members. Questionnaires were also handed in by several writers, a photographer, a gemologist, a blood bank director, and a housewife.

Many respondents suggested that they would like to see general seminars on word processing or on database management systems, but seminars on specific products, such as *dBASE II* and Lotus' *1-2-3*, were also frequently requested. The topic that lead the list, however, was the C programming language.

Members were also asked to comment about what they thought software vendors could do to improve service to customers. Of those responding, over a third complained about dealers' lack of knowledge of the products they sell. Another complaint was the lack of telephone support for customers, and many members suggested vendor hot lines as a solution.

The survey results confirm that the Capital PC User Group is an extremely

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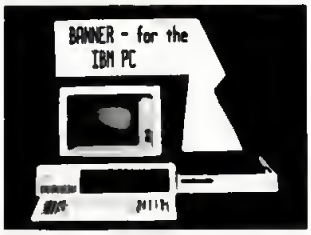

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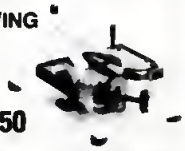

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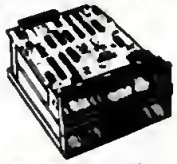

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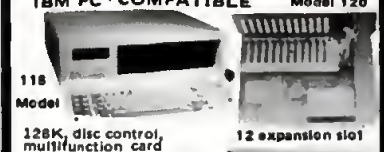

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CLUB NEWS

active group of business-oriented personal computer users who expect, and get, a great deal from their machines. Still, they are hungry for more useful and instructive information about using PCs, as evidenced by the large turnout at the monthly meetings and by their formation of so many special interest groups.

Readers interested in CPCUG should write to Capital PC User Group, P.O. Box 3189, Gaithersburg, MD 20878. The annual membership fee is $25 and includes a subscription to the *Monitor*, CPCUG's monthly newsletter. ■

Harry Foxwell is a programmer/analyst for the American Chemical Society in Washington, D.C., and is chairman of CPCUG's Special Interest Group for Statistics.

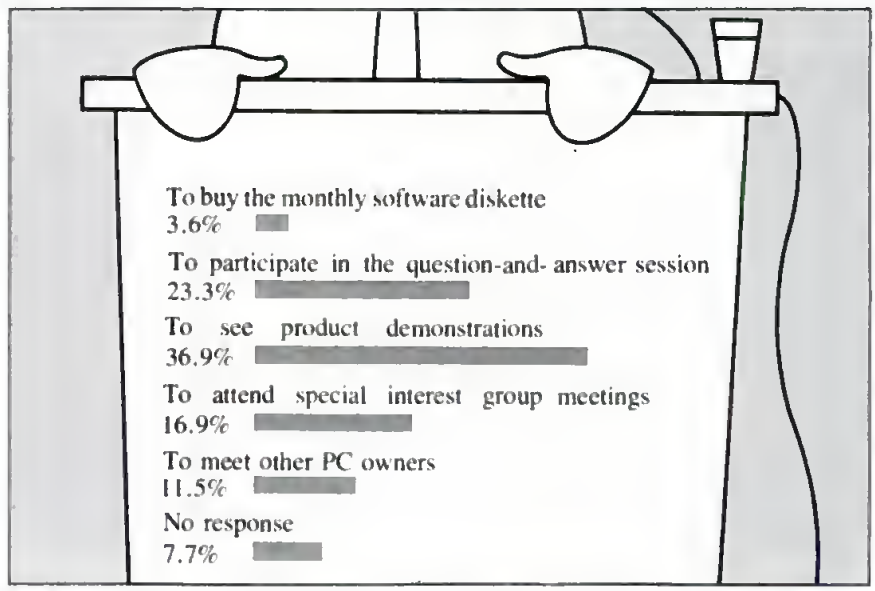

Figure 1: *What is the most important reason you attend the CPCUG monthly meetings?*

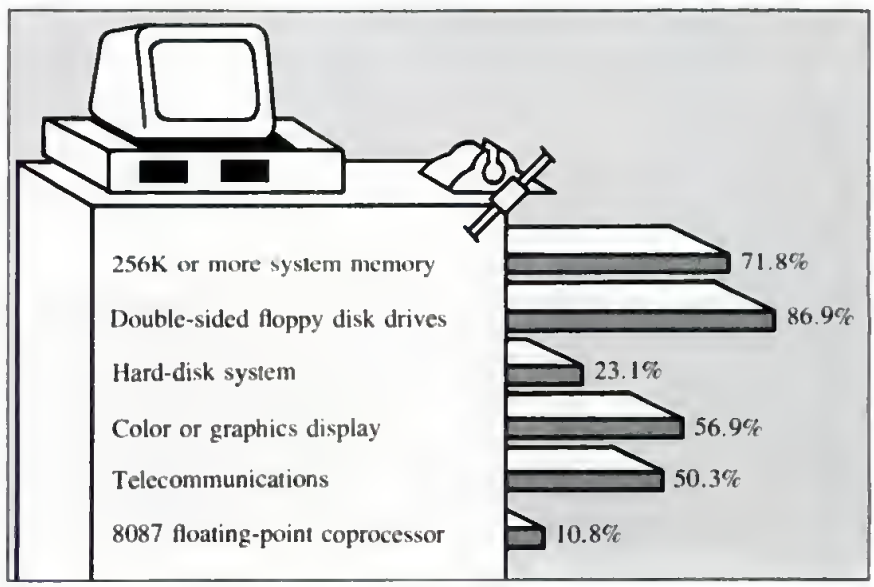

Figure 2: *Hardware configurations used by CPCUG members.*

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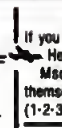

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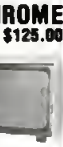

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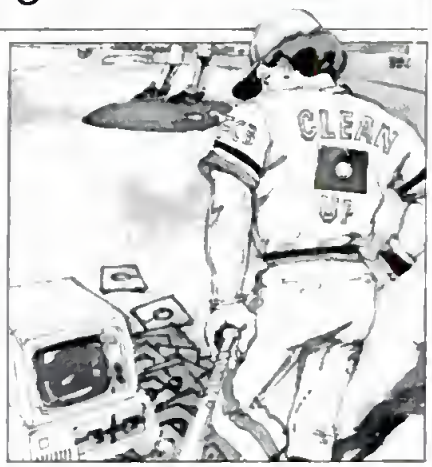
Operation Cleanup

The Cleanup utility doesn't have any frills, but it does have a useful tool that DOS lacks: selective deleting.

If you work the same way I do, your most frequently used set of disks includes a DOS backup, a utility disk, a backup disk (to get the programs that finally work out of harm's way), and a favorite disk for program development. This development disk is usually crammed to within 1 byte of disaster with pet programs, current projects, and some past triumphs. When the assembler needs, say, 20K for a listing, it becomes a cause for concern. Usually what I do is type DIR, mark down the ten biggest files that I no longer need, and delete them, one by one. In my haste I usually don't delete enough files, leaving insufficient space on the disk. The macro assembler then implacably fills my disk to overflow, and since it can't close the list file properly it creates lost clusters all over the disk. To avoid this and to make deleting extra files easier and more efficient, I wrote a small utility called "Cleanup."

With this utility I tried to supply the most use for the least bytes. With 98 bytes, Cleanup provides a useful tool that our marvelous machine doesn't have: selective deleting. If you want to, say, clean up your collection of BASIC files on a disk, you type CLEANUP *.BAS, and Cleanup will display the names of all BASIC files and ask you, one by one, if you want to delete them. If you type Y or y the Cleanup utility deletes the file; otherwise the file stays. If you want to trim your entire disk, type CLEANUP *.*. At 98 bytes it doesn't have many frills, but it gets the job done.



To get cleanup working on your PC, type in the BASIC program in Figure 1 and run it. This opens CLEANUP.COM, fills it with the bytes you see in the data statements, and closes it, giving you your own copy of the program.

About File Control Blocks

Understanding how Cleanup works provides a simple introduction to how DOS uses files at a low level.

At the heart of DOS' file-handling ability is the File Control Block or FCB. FCB may sound like a pretty official term, but relax—the idea is simple. The FCB for a file is to DOS what the file name is to us.

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Everything DOS needs to know about a file is in the 37 bytes of its FCB.

All we need to know about FCB's for Cleanup is in Figure 2. This is a picture of the FCB for the file A:BASEBALL.BAT before it is opened. Byte 0 (zero) holds the drive number and 1 means A:, 2 means B:, and 0 means no drive was specified and the default drive should be used. The next 8 bytes give the name (BASEBALL), and the next three, the extension (BAT).

For instance, if I wanted to read at random a record in BASEBALL.BAT using BASIC, I would say OPEN "BASEBALL.BAT" AS #1 LEN 512. This opens BASEBALL.BAT for use with buffer #1 and defines the record length to be 512 bytes (the default is 128). To read record 7, I would say GET #1,7.

In assembly language, the process for reading a random record from a file is similar. I start with an unopened FCB for BASEBALL.BAT as in Figure 2 and open it with one of the function calls of DOS interrupt 21H (I'll discuss the details of function calls later). Opening the file fills in the other bytes in the FCB, including the date of creation and the length of the file in bytes. Like BASIC, the default for the record length is 128 bytes. This number is stored at bytes 14 to 15 in the FCB and could easily be changed to 512 (as LEN did above). To read the record we

```
100      OPEN "CLEANUP.COM" AS # 1  LEN = 1          'Open Cleanup com
110      PRINT "CREATING CLEANUP.COM"
120      FIELD #1,1 AS BYTE.$                        'Specify what goes into it
130      FOR N = 1 TO 98                             '98 bytes
140      READ BYTE.%
150      LSET BYTE.$ = CHR$(BYTE.%)                  'Load byte into buffer
160      PUT #1                                      'Write buffer out
170      NEXT N
180      CLOSE #1                                    'Close file
190      PRINT "CLEANUP.COM CREATED."                'And you're done.
200      END
210 DATA         235,    20,     144,    13,     10,     68,     69,     76
220 DATA         69,     84,     69,     32,     36,     32,     40,     89
230 DATA         47,     78,     41,     63,     32,     36,     186,    92
240 DATA         0,      180,    17,     205,    33,     168,    1,      117
250 DATA         63,     46,     141,    22,     3,      1,      180,    9
260 DATA         205,    33,     187,    129,    0,      180,    2,      185
270 DATA         11,     0,      138,    23,     67,     205,    33,     226
280 DATA         249,    46,     141,    22,     13,     1,      180,    9
290 DATA         205,    33,     180,    1,      205,    33,     60,     89
300 DATA         116,    4,      60,     121,    117,    7,      186,    128
310 DATA         0,      180,    19,     205,    33,     186,    92,     0
320 DATA         180,    18,     205,    33,     168,    1,      116,    193
330 DATA         205,    32
```

Figure 1: *A BASIC program that opens the CLEANUP.COM file.*

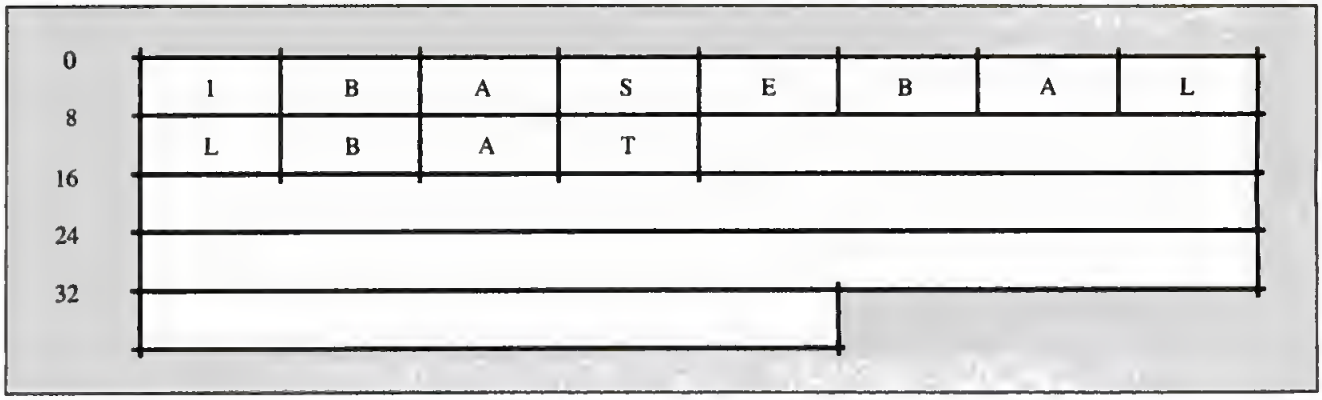

Figure 2: *An unopened File Control Block (FCB).*

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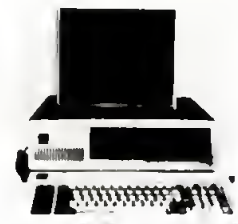

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CIRCLE 201 ON READER SERVICE CARD

use another function call of INT 21H (instead of GET #1,7), and instead of reading into buffer #1, DOS reads into the disk transfer area or DTA (it's called DTA rather than buffer because in assembly language nothing over three letters is terse enough to merit serious attention). The DTA, or buffer, is just like the buffer used in BASIC file reading and writing. It has an important place in Cleanup, and DOS makes using it easy.

In fact, DOS makes handling of FCBs and DTAs remarkably smooth. It even creates both DTAs and FCBs for you and instead of letting them run around free in memory attaches them conveniently to your program. It does this by bundling our cares into another of those acronymic packages, the PSP (program segment prefix). This is the last new concept I'll cover in this article, but it's probably also the most useful. Once you know about the PSP, not using it is about as hard as getting lost on an escalator.

The Program Segment Prefix

In many ways DOS is as polite an operating system as you could ask for. When it loads one of your programs it tries to provide it with as much help as possible by picking a free space in memory and making a program segment prefix for your program there. Then DOS loads your program in after the PSP, starting at 100 Hex (which is why COM files must start there). Knowing about the PSP is crucial to the assembly language programmer because of the wealth of information packed into it, including the location of the next free section of memory that the address control will return to when the program is done, and other addresses of no small worth.

The section of the PSP I'll cover here starts at 5CH and continues to the end at 100H. Let's say that you have a word processor named *PurpleProse*, which you invoke with the command PP filename.ext. To edit a file named ILIAD2.TXT you would type PP ILIAD2.TXT. What DOS does is set up an unopened FCB for ILIAD2.TXT starting with 5CH in *PurpleProse*'s PSP. To see this (you might want to give this a try) type, for example, DEBUG PP.COM ODYSSEY2.TXT and then D ES:0 FF to dump the PSP (and then Q to quit DEBUG). There's a picture of a PSP with an unopened FCB for ODYSSEY2.TXT in Figure 3.

All of this is not to neglect the DTA. If I typed "DEBUG PP.COM All of the survivors of the war had reached their homes by now" and then D ES:0 FF, I would see that DOS put all the text typed after

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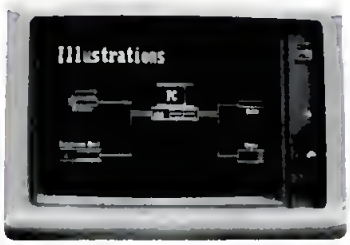

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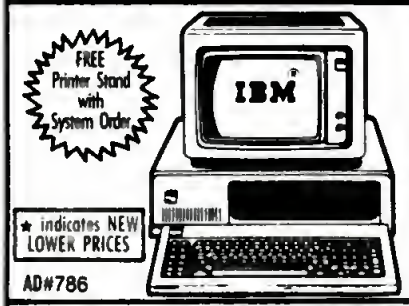

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PP.COM into the default DTA in the PSP, which starts at 80H and is 80H (128) bytes long (going to 100H). The number of characters typed is stored in the byte at 80H and the text begins at 81H. This is the way DOS allows you to pass filenames or instructions to your program, which, as an applications programmer, pleases me. If you type a program name and then a filename, DOS will place an FCB for the file in the PSP at 5CH. If you type text, it goes into the Disk Transfer Area at 80H (DOS also treats the first word as a file (since it doesn't know any better) and therefore puts an FCB for it at 5CH.

Return to Cleanup

After you master the concepts of FCBs, DTAs, and PSPs, Cleanup is a breeze (as are many other applications). And it's DOS that makes it so with the functions called by INT 21H. This is the so-called

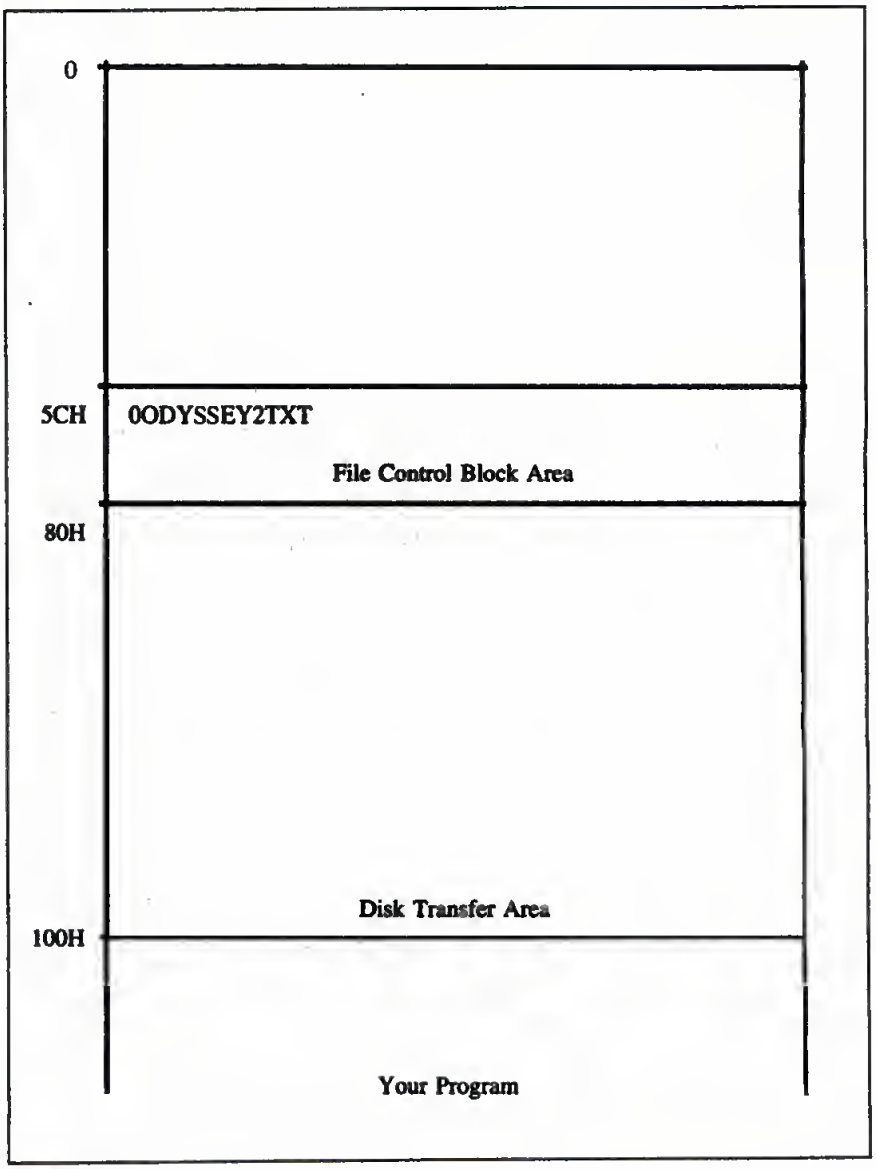

Figure 3: *A Program Segment Prefix for ODYSSEY2.TXT.*

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CIRCLE 422 ON READER SERVICE CARD

```
        ;-----------------------------------------------------------------------
        COMMENT* This program runs with DOS 2.0 or DOS 2.10 and provides a
        selective cleanup of files by asking whether it should delete files
        that match the string given to it. Use it by typing 'CLEANUP FILE EXT'
        Respond with a 'Y' (or 'y') to delete, any other character not to. *
        ;-----------------------------------------------------------------------

CODE_SEG        SEGMENT                 ;Begin Code Seg
        ASSUME  CS:CODE_SEG
        ORG     100H                    ;Org 100H for Com files
ENTRY   JMP     CLEANUP                 ;Skip over data

        MSG_PART_1 DB   13,10,'DELETE $'        ;<CR>,<LF>,then message
        MSG_PART_2 DB   ' (Y/N)? $'             ;End with a '$' for DOS

CLEANUP   PROC    NEAR

        MOV     DX,5CH          ;Point to FCB of desired file
        MOV     AH,11H          ;Ask for DOS service 11H,
        INT     21H             ; which looks for first match.
        TEST    AL,1            ;Found?
        JNZ     END             ;No, exit

TOP     LEA     DX,MSG_PART_1   ;Get offset of first part of message
        MOV     AH,9            ;DOS service 9 prints until it finds a '$'
        INT     21H             ;Print out first part of message
        MOV     BX,81H          ;FCB in DTA from last search
        MOV     AH,2            ;Going to print with DOS service 2
        MOV     CX,0BH          ;11 characters per file
THELOOP:                        ;Print loop
        MOV     DL,[BX]         ;Get a char,
        INC     BX              ; and increment the pointer.
        INT     21H             ;Print it
        LOOP    THELOOP

        LEA     DX,MSG_PART_2   ;Print (Y/N)? part
        MOV     AH,9
        INT     21H
        MOV     AH,1            ;Use DOS service 1 -- key input
        INT     21H             ;Get pushed key
        CMP     AL,'Y'          ;Was it a 'Y'?
        JE      DELETE          ;Yes; delete
        CMP     AL,'y'          ;No . was it perhaps a 'y'?
        JNE     SAVE            ;No -- save this file (response not Y or y)

DELETE: MOV     DX,80H          ;Point to FCB of found file
        MOV     AH,13H          ;Use DOS service 13H to delete it.
        INT     21H
SAVE:   MOV     DX,5CH          ;Search for next match -- point to original FCB
        MOV     AH,12H          ;Search for next match
        INT     21H
        TEST    AL,1            ;Found?
        JZ      TOP             ;Yes, continue
END:    INT     20H             ;Exit.

CLEANUP   ENDP
CODE_SEG        ENDS
        END     ENTRY           ;End 'Entry' so DOS will go to 'Entry' first.
```

Figure 4: *Assembly language listing for the Cleanup utility.*

function call interrupt; it is the key to almost all of the file-handling routines that DOS has. To call, say, function 5, you load 5 into the AH register and execute an INT 21H instruction. The way Cleanup works in a nutshell is this: to clean up your BASIC programs you type CLEANUP *.BAS. DOS puts an unopened FCB for this name at 5CH of Cleanup's PSP. DOS has a terrific set of INT 21H functions, 11H and 12H, that searches through the disk directory. Function 11H finds the first match in the disk's directory to an FCB we give it, so we'll give it the one at 5CH, and it will find a match to the filename you typed in. If it finds a filename that matches, it returns the match's FCB in the DTA at 80H. Now the original FCB is at 5CH and the first match is at 80H. Cleanup asks if you want to delete this file by typing out its name and extension, which are just the eleven letters starting at 81H (skipping over the drive number at 80H0.

If you type Y or y, Cleanup calls function 13H, the next in the series, which deletes a file. To delete a file it needs the file's FCB, so we give it the match's FCB at 80H in the DTA in cleanup's PSP (if you were waiting for all this to come together this is surely the place). Cleanup then uses function 12H to search for the next match (function 11H finds the first match and 12H all subsequent ones), which it will also put into the DTA. Cleanup keeps going until it runs out of files or you type Ctrl-C.

The complete assembly language listing of Cleanup is in Figure 4. If you take a look you'll see heavy use of INT 21H. Now that you have conquered a few of the PC's formidable acronymic mysteries—the FCB, DTA, and PSP—I hope you'll use them (unless you're one of those people who gets lost easily on escalators).

For a copy of a disk containing Cleanup and five other utilities, send $40 to Steven Holzner, 903 E. State St., Ithaca, NY 14850.

Steven Holzner is pursuing a Ph.D. in physics at Cornell University.

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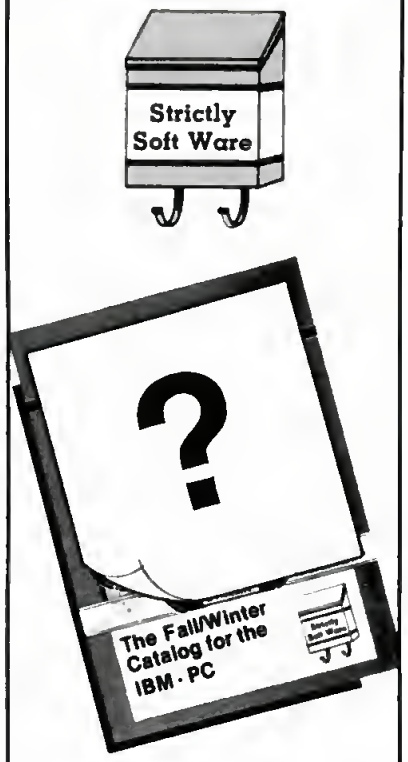

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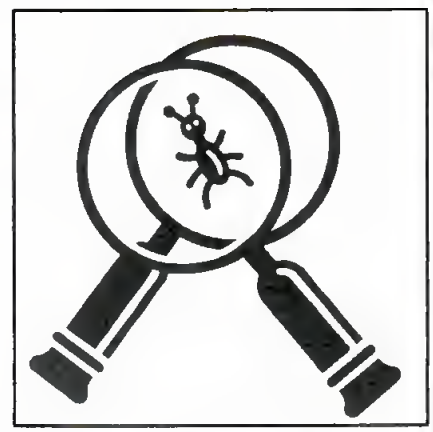

Free DOS 2.x Telephone Directory

Hate to look up numbers in your telephone book or Rolodex? You don't ever have to again; DOS 2.0 or 2.1 can do all the work for you. It's incredibly simple, and the price is right. It works far better on a PC-XT (most everything does) but muddles through on a PC if you don't mind copying your directory and the important batch files from floppy to floppy.

The trick is to create two batch files and the initial bare framework of a directory. Type these in using the pure-ASCII mode of a word processor (such as WordStar's *"N" mode), or just peck away in DOS using the COPY CON: command. The example in Figure 1 uses the second technique. Type in everything underlined and hit the Enter key at the end of each line, then hit the F6 key and then Enter after you're done typing in the last line.*

That's all there is to it. Just create a subdirectory \PHONES that contains these two batch files (ADD.BAT and LOOKUP.BAT), the directory itself (DIRECTRY), plus the DOS FIND.EXE filter (it's on your DOS disk). Copy the DOS SORT.EXE and MORE.COM filters too, if you really want to get fancy.

Whenever you want to add names, just get into DOS and type ADD. The ADD.BAT batch file will print out a three line message, then prompt you with:

```
A>copy con:addthem.now
```

When you see this line on your screen type in the names and numbers you want included in your directory. Be sure to hit the Enter key at the end of each one. You can enter one name/address/phone or as many as you want, but be sure to hit the Enter key after each. And most important, when you're all done entering information, hit the Enter key, then the F6 key, then the Enter key. The batch file will automatically add these new listings to the master directory.

If you want to use first and *last names to look up telephone numbers and addresses, use a period rather than a space to separate the last name and the first name (see Figure 2). To look up the*

listing for Beaver Cleaver (after you've entered it, of course) just type:

```
A>lookup Beaver
```

and hit Enter. DOS will use the FIND filter and its replaceable-parameter trick to pop the Beaver's number onto your screen. The reason you should use a period between the first and last names is that if you wanted Beaver and not Wally, you would have to enter:

```
A>lookup Cleaver.Beaver
```

If you typed in simply:

```
A>lookup Cleaver
```

you'd get the listings for both Cleaver boys. Okay, Beaver is an unusual name, and there's probably just one, but with others you might not be so lucky.

You can also look up fragments. If you want to peek at everyone with a 900xx zip code, you could lookup 900. (This isn't perfect; it would also dredge up an address like 900 Main Street. But what do you want for free?) And all you have to type in to find Aloysius Fotzgreeble is either "lookup Alo," or "lookup tzg." You do have to observe capitalizations; you won't be able to locate Beaver by typing in "Lookup beaver." And if you forget someone's name but remember that he lives on Ozone Ave. or works for Chain-saw Films, you can find him by hunting for those keywords.

You can also change the LOOKUP.BAT batch file by piping the output through the MORE filter:

```
A>copy con:lookup.bat
find "%1" directry | more
```

Obviously, if you do this, make sure MORE.COM is on your disk. This slows the lookup operation down but is necessary if you scan through more than a screen of Joneses at one time.

And you can get even trickier, by routing the data through the sort filter. For example:

```
A>copy con:lookup.bat
find "%1" directory | sort | more
```

```
A>copy con:add.bat
.. 1 - Enter any new phone directory information below.
.. 2 - Hit <ENTER> at the end of each line ==> ESPECIALLY THE LAST LINE! <==
.. 3 - Hit the <F6> key and then <ENTER> when you're all done.
copy con:addthem.nov
copy directry+addthee.nov
del addthem.nov

A>copy con:lookup.bat
find "%1" directry

A>copy con:directry
************************ TELEPHONE DIRECTORY ************************
```

Figure 1: *Instructions for typing in ADD.BAT and LOOKUP.BAT batch files, plus the bare-bones DIRECTORY file, using the DOS COPY CON: command. (1) Type in everything underlined. (2) Hit the Enter key at the end of each line. (3) Hit the F6 key and then the Enter key at the end of each of the files.*

```
A>copy con:addthem.nov
Cleaver.Beaver, 123 Mather Way, LA, CA 90012 -- 213-555-3245
Rutherford.Clarence 56 Lummox Ave, Redondo Beach, CA -- 213 555-0978
Cleaver.Wally, 123 Mather Way, LA, CA 90012 -- 213-555-3245
^Z
```

Figure 2: *Sample input using ADD.BAT. Note that the first and last names are separated by a period, not a space. The ^Z is the end-of-file character generated when you hit the F6 key.*

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This will sort the found entries by the first letter in the listing, which makes it a good idea to enter your names and numbers last name first. Again, if you do this, stick SORT.EXE on your disk.

To many novice users, it may be hard to remember how to change directories, load software, or specify paths. A simple approach to this problem is to create a menu.

Finally, you may want to adapt any of the LOOKUP.BAT files above by throwing in a redirection to your printer—just add:

```
>prn
```

to the end of the find . . . line in your LOOKUP.BAT file. Or you can toggle the printer echo on by hitting Ctrl+PrtSc.

—P.S.

Batch Files...

To many novice users, the DOS prompt A> can be very frightening. It may be hard for such a user to remember how to change directories, specify paths, or load software, and there is frequently a fear that some command might erase all of the information in the computer. A simple approach to this problem is to create a menu, whch is less intimidating to the novice user. The procedure described below uses text files and batch files to create a menu-driven command environment for the user.

The first step is to create an ASCII file called MENU.TXT that contains the menu to be displayed. This file may have as many as 23 lines; any more lines will not fit on the screen. Each menu selection should be preceded by a number that will be used to make the selection. The menu can contain headers, instructions, or any other desired text. Here's a sample menu:

```
PDQ CORPORATION
PHIL'S COMPUTER
MAIN MENU

1. Microsoft Multiplan
2. MicrosoftWord
3. Back Up Hard Disk
4. Display Games Menu

To make a selection from the above
menu, type the desired number and
press enter, or, you may enter any DOS
command.
```

The second step is to create a batch file called MENU.BAT that displays the menu on the screen followed by the DOS prompt. The batch file consists of only three lines: ECHO OFF, CLS, and TYPE MENU.TXT. The echo command is necessary to prevent the DOS prompt from being displayed twice. When MENU.BAT is executed, the screen will display up to 23 menu lines, a blank line, and then the DOS prompt.

The third step is to create a batch file for each of the menu selections. Each of these batch files will be named with the number that precedes the menu selection. The batch file may be as simple or complex as required, but the batch file must end in the same directory where the menu screen is located, and the last statement in the batch must be MENU. This statement should also be added at the end of the AUTOEXEC.BAT file. The batch files used by the sample menu are shown in Figure 3.

These batch files illustrate several sample uses of the menu. 1.BAT and 2.BAT load the software for *Multiplan* and *Word*, respectively; the replaceable parameter allows the user to specify the

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data file to be loaded just as if the software was loaded directly. 3.BAT automates a procedure that may intimidate some novice users; if a backup is simple to do, you are more likely to do it as often as you should. 4.BAT demonstrates the use of submenus. Although GAMEMENU.TXT and the batch files in the \GAMES directory are not shown here, each menu must end with the commands CD \ and MENU in order to return to the main menu screen.

This procedure is recommended for its simplicity and flexibility. Its chief advantage is that the computer remains at the DOS level; the novice user can enter the menu numbers and use the computer without worrying about paths, directories, or unfamiliar DOS commands, while the advanced user can enter any DOS command desired.

Philip L. Bewig
Saint Louis, Missouri

Another oldie but goodie, and further tribute to the magical DOS batch file. If you need more than 23 lines, you can gang up several menu choices on one line, so long as they each have a unique and clearly defined menu selection number. The real beauty of this trick is that when the user quits the application or utility in the individual batch files, the batch file runs the main MENU.BAT file, which gives him more menu choices. If you create a batch file like this for a novice user, be sure to include a QUIT option that turns everything off and prints out a message like "Good Night." Like virtually everything else, this works far faster and better on a hard disk or RAMdisk . With a RAMdisk the response is virtually instantaneous, since the batch files are so short. On a floppy, you have to suffer through a lot of slow grinding.

1.BAT

```
CD \DATA\MP
PATH \PROGRAM\MP
MP %1
CD \
MENU
```

2.BAT

```
CD \DATA\WORD
PATH \PROGRAM\WORD
WORD %1
CD \
MENU
```

3.BAT

```
BACKUP C:\DATA A: /S
MENU
```

4.BAT

```
CD \GAMES
MENU
```

Figure 3: *Sample batch files for the MENU program.*

The novice can enter menu numbers while the advanced user can enter DOS commands.

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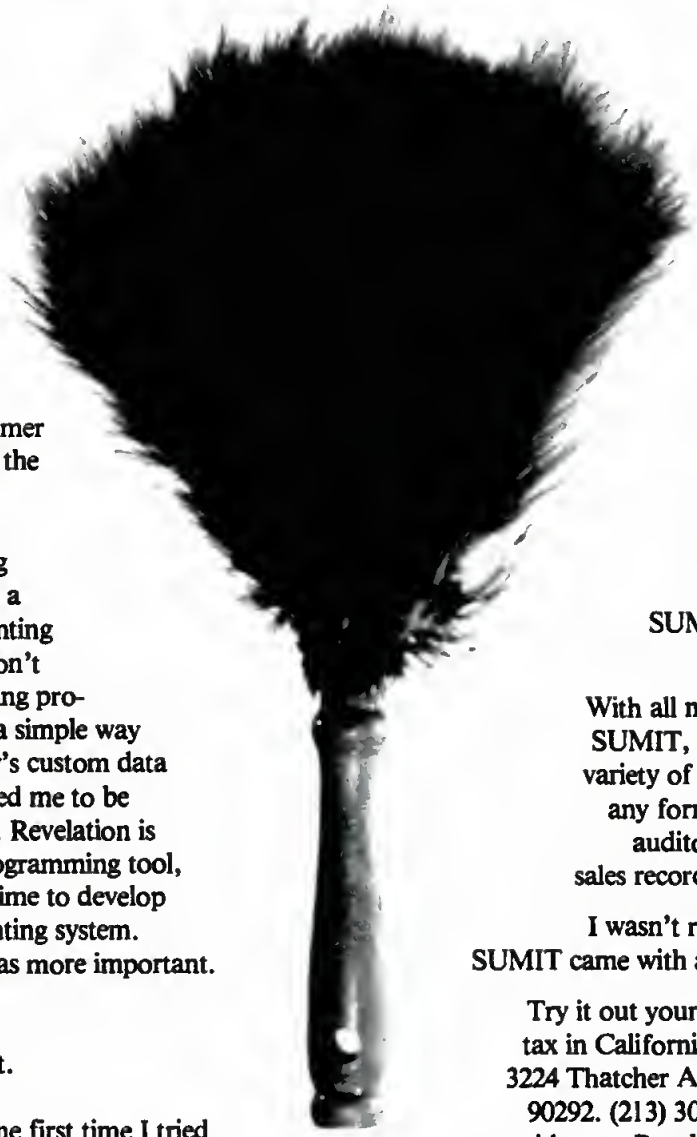

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by George Polichar

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MARK ZACHMANN

PC Tutor

Resizing Sectors

Q: How can I modify PC-DOS or the BIOS to change the sector size of a disk? I'd like to do this to set up a crude form of copy protection. Can I do this through BASIC or Pascal as well as assembly language?

Marc H. Simkin
Riverdale, New York

A: *Changing sector size is pretty simple. Memory location 0000:0078 is a double-word pointer that leads to the diskette parameter table, which is a set of 11 bytes. By changing the table values or the pointer, you can modify the way the disks are read.*

In the diskette parameter table, only the fourth and fifth bytes involve reading and writing. The fourth byte determines the number of bytes per sector on the disk: its 0 bit 128 bytes per sector, the 1 bit 256 bytes, the 2 bit 512 bytes, and so forth. The fifth byte in the table determines the number of sectors per track, which is usually eight or nine.

If you change the sector arrangement, you'll need to format the disks manually. That process is too complicated to explain in this column; refer to the "Diskette I/O" documentation on pages A-34 and A-35 in the XT's Technical Reference *manual.*

BASIC Upon BASIC

Q: Do the 16,768 bytes in Advanced BASIC (BASICA) contain all 11,392 bytes of Disk BASIC (usually just called BASIC)? I only use monochrome on my system, so I copy just BASIC onto my working diskettes. Some other users tell me they always transfer BASICA and nothing else onto their disks.

Is it ever necessary to have both BASIC and BASICA on a working diskette?

Karl F. Steinhauer
Des Plaines, Illinois

A: *I don't know if all the bytes are in the same place in the two BASIC language interpreters, but all features in Disk BASIC are included in Advanced BASIC as you can see if you look through the IBM BASIC manual. Not all features in BASICA, however, are in lower versions of BASIC.*

According to the BASIC manual, the three versions are upward compatible: Everything in Cassette BASIC (the BASIC in the PC's ROM) is contained in Disk BASIC, which is contained in Advanced BASIC (BASICA).

There are other parts of BASIC, besides the graphics functions, that can only be found in BASICA. There are routines for more sophisticated sound control through PLAY; keyboard trapping with KEY(n); and timer, joystick, and communications port routines.

Negative Memory

Q: I have an IBM PC with 640K RAM. The other night I tried to enter FORMAT B: /S and got a shocking "Insufficient Memory" error message. I pressed Ctrl-Alt-Del to do a warm reset and clear the contents of the RAM and afterwards ran

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CHKDSK, which informed me that I had over 600K RAM free. Even then I couldn't get FORMAT B: /S to work.

I started to experiment. CONFIG.SYS initially said BUFFERS20, but when I reduced the buffers to 13, the FORMAT command worked. (With BUFFERS14 the error returned.)

What caused the problem in the first place. Do you have any ideas?

Conrad S. Kageyama
Gardena, California

A: *Your problem occurs because IBM and Microsoft initially didn't expect PC users to install as much memory as you have. The system (including the FORMAT program) uses 16-bit integers, stored in a two's-complement form, which allow for negative as well as positive values. In the middle of the 16-bit numbers, at the hexadecimal number 8000h, the decimal values switch between negative and positive. Therefore, FORMAT calculates that you have a negative amount of memory.*

The error message should disappear if you set the DIP switches in your PC to indicate that it only has 480K (or less) of memory. I think this bug was fixed by the time PC-DOS 2.1 was released.

Restoring a Hard Disk

Q: In our office we use a Columbia computer, model 1600-4, with a 10-megabyte hard disk. It runs MS-DOS 1.25 with Columbia's 2.11 operating system and has the version 4.33 upgraded ROM.

Recently, the operator typed ERASE B: and pressed the Return key. The Columbia responded with a BAD COMMAND.COM error message, and the hard disk was rendered useless.

There might be a better way to fix the problem, but at the time, the only alternative seemed to be to reconfigure the whole system.

Once we put a proper COMMAND.COM program on the hard disk, however, the rest of the hard disk's contents were no longer available. We had to restore the hundred or so programs that had been stored on the hard disk. Is there a way to avoid reformatting and restoring the hard disk after such an error?

Robert C. Sacks
Lilburn, Georgia

A: *If your hard-disk Columbia works like an XT, all you need to do when COMMAND.COM on the hard disk fails to work is to boot up from a floppy disk by placing a system disk in the diskette drive before you turn the power on.*

The COMMAND.COM program is just a file—it doesn't have to be installed on the hard disk for you to boot up the operating system. Once your computer has booted up from the floppy disk into PC-DOS, you can copy the COMMAND.COM file onto the hard disk's root directory.

In the future, keep a system diskette close at hand in case problems with booting up from the hard disk come up again. You can make a system diskette by entering FORMAT A: /S to format the diskette and then copying COMMAND.COM onto that diskette.

The only booting calamity that can keep you from getting at programs on your hard disk is if the boot sector at the beginning of the disk is ruined. It is extremely difficult to hurt that sector, fortunately.

By the way, when I typed ERASE B: on my IBM machine, it merely gave the message "File Not Found." The same should happen on your Columbia computer.

Making a Meter

A few issues ago, Todd Deutch wrote that his computer causes interference on televisions in his house ("PC versus TVs," PC, Volume 3 Number 8, page 413). One of my suggestions was to check over the computer system with a field strength meter to detect radio frequency (RF) interference.

Another reader, John Hoffman of Manhasset, New York, has suggested a simple way to construct an RF field strength meter. This project is inexpensive: The total cost of parts is about $10, and all

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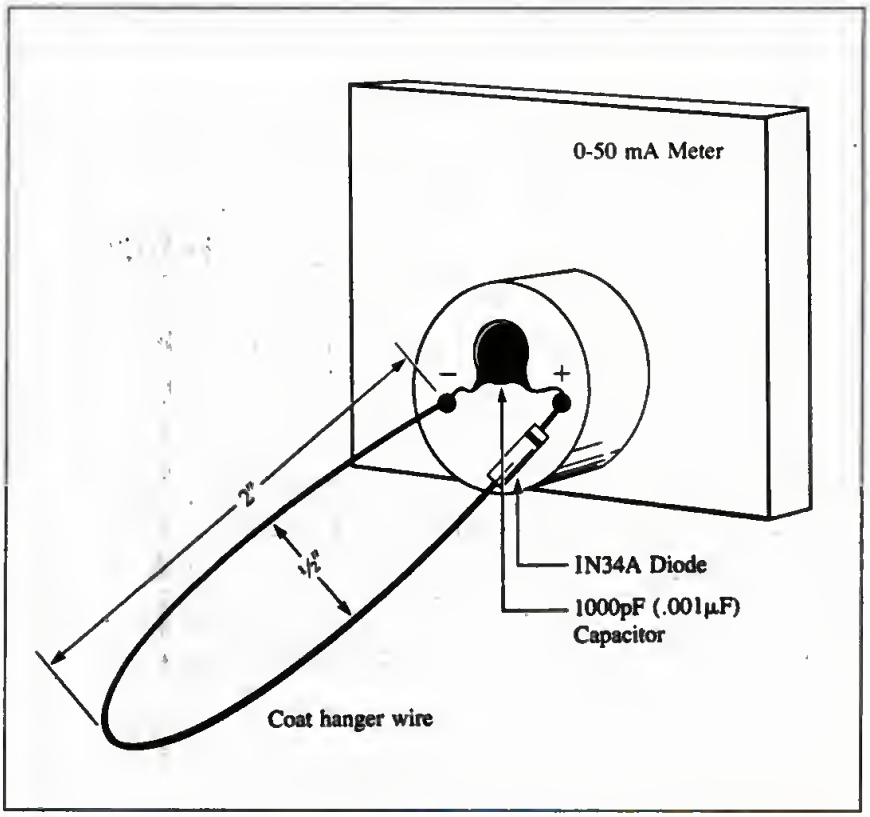

Figure 1: *You can build this inexpensive field strength meter to detect radio frequency interference around your computer.*

items are available from Radio Shack.

The required parts are a 0-to-50 microamp meter (Radio Shack part number 270-1751), one 1N34A germanium diode (276-1123), and one 1000 picofarad (pf) capacitor (272-126). (In place of this capacitor you can use two 470 pf capacitors (272-125) in parallel.) In addition, you need a piece of coat hanger wire about 5 inches long. (See Figure 1.)

First, solder one end of the wire to the negative terminal of the meter. Bend the wire into a loop about 2 inches long and ½ inch wide. Leave about ½ inch between the free end of the wire and the positive terminal of the meter.

Use the 1N34A diode to connect the wire to the positive terminal of the meter. The end of the diode with a black band should be towards the meter.

Finally, attach the single 1000 pf (.001 microfarad) capacitor (or the pair of 470 pf capacitors) between the meter's two terminals.

This device is essentially a wide-bandwidth crystal radio with a needle meter attached instead of a speaker. The scale on this meter will not give you accurate measurements of field strength, but movement of the needle will give relative readings that you can use to detect where the most interference is coming from.

In fact, if the interference is strong and broad enough, you can use a cheap transistor radio as a field strength meter. Just move it around your computer system and listen for the loudest hiss.

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CIRCLE 338 ON READER SERVICE CARD.

Circulation On the PC

Relying on outside services to maintain your publication's mailing lists and readership data can be expensive and time-consuming. The Publiphile program offers an alternative.

If you publish a magazine or newsletter, you will eventually come up against one of publishing's most time-consuming activities: mailing list maintenance.

Maintaining subscriber lists is more complicated than you might think. It involves much more than simply recording a name, title, address, and expiration date for a subscriber. In today's competitive market, statistics on readership play an important part in a publisher's marketing strategy.

For example, if you published a computer magazine, you would want to tell prospective advertisers not only how many people read your magazine, but what type of computers they own, if they plan to buy computers, if they own their own businesses, and how much money they plan to spend on computer products in the next year.

Publishers have traditionally turned to outside circulation services that use mainframe computers to maintain information on readers and subscriptions. Unfortunately, this arrangement sometimes makes both small and large publishers unhappy. Small publishers pay premiums because of the small volume of their circulation—they encounter "minimum charges" for activities that run unit prices up beyond those charged to larger publications. The larger publishers pay out large sums of money for the service, yet they may feel a lack of control over the quality of data input and are denied free access to information about their own readers.

Illustration: Philip Anderson

For these reasons, bringing circulation file maintenance in-house is an attractive idea to publishers that want to gain control over circulation files and eventually reduce the cost of maintaining readership data. Until recently, however, efforts to do this met with mixed results. In some cases, large-circulation publishers tried to maintain data on computers that were too small, and small publishers felt the cost of hardware was too high.

Software Breakthrough

Fortunately, computers have reached a price/performance level where more publishers feel that they can successfully handle circulation on their own. The last stumbling block has been software. Until a short time ago, there was really no stand-alone software for circulation maintenance. Most circulation software that was available was sold only with the computer that it would run on.

The IBM PC has been a boon to publishers looking for circulation software. The advantage is that programs written for the IBM PC are transportable, and the software vendor will sell the program without the computer attached as part of the deal.

To help manage circulation files using an IBM PC or compatible, WPL Associates of Silver Spring, Maryland, has produced a software package named *Publiphile*.

Publiphile is a database application developed on *dBASE II* with *dBASE II*'s advantages and limitations. The benefits

Publiphile
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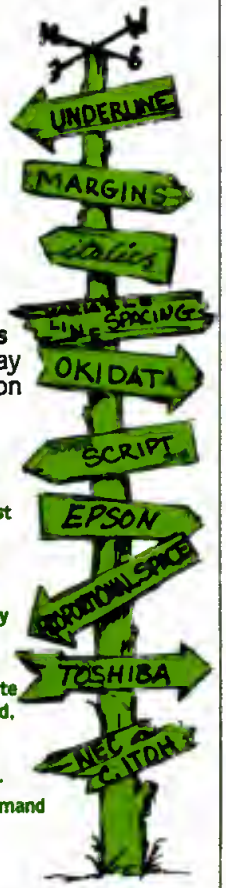

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are many. Since WPL Associates was thoughtful enough to make the program available with source code, a user can modify the program and database structure to his liking. Custom reports can be created easily since the source code allows access to file names, sizes, field names, and related file structures.

The limitations of *dBASE II* make *Publiphile* most appropriate for small circulation publishers. *dBASE II* has been a single-user system and has a ceiling of 64,000 records; therefore, a publisher with 100,000 readers would not be able to use such a program.

An important part of *Publiphile* is its ability to perform accounting reports, such as how much money has been received from subscribers, how much is expected from renewals, and reports on unearned income.

The program is designed to meet the needs of a publisher who must maintain records of when a subscription begins and ends, how much the subscription costs, how much money has been collected on the subscription, and the source of the subscription (a direct-mail response, a new subscription, or a renewal, for instance).

The program also records basic subscriber information such as a complete mailing address, the subscriber's occupation, purchasing responsibility, number of employees, or whatever information the publisher wishes to collect.

Using the Program

Publiphile was designed, according to WPL Associates, so that "anyone could use the program without knowing anything about computers." This objective has been accomplished because of a well-written manual and data entry screens designed for ease of use.

The program uses menus to guide an operator through the difficult process of maintaining subscription files. Many systems separate out mailing list functions such as recording new orders, renewals, or cancellations. *Publiphile* has taken the sensible route of making all these activities available from the main menu of the Transaction Entry System, which offers the following options: New Order, Renewal, Trial Conversion, Payment, Cancellation, Suspension, Do Not Renew, Address Change, and Inquiry.

Once data has been entered into the system, *Publiphile* begins to show its true value to a publisher. While the database is set up to record a subscriber's history and produce mailing labels for the subscriber base, a publisher needs to analyze the transactions that have taken place in any given time period.

An example would be list testing. To obtain new subscribers, a publisher will do a mailing with a special code on the return order card. As subscriptions are entered into the system, the code is entered onto a subscriber's record. With this informa-

```
Main Subscriber File   04/18/84

Transaction:  Current N              Previous N                 Update 840418
 Record Number          1            First entered 840418          ID      1
 Source :PROFUB:                     Active (T/F)? :T:
 Separate billing address (Y/N)? :N:
Mailing address:
 Name (Last) :ULICK          : (First) :TERRY          :
 Title code  :01  : Company :THE RENESADE COMPANY          :
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Purchase order number: :12345   : File flag: :      :
Special comment :                    :
Previous payments:       0.00  New payment: Mode :C :      Amount $:   30.00:
```

A sample record from *Publiphile*'s main subscriber file.

tion in hand, an analysis can be made of how well the subscription effort has done by examining the number of responses to the mailing. *Publiphile* includes reporting capabilities to examine activity according to the code for subscription source or by expiration date, publication code, or key code.

In addition, *Publiphile* includes reports on transactions such as a General Subscriber Summary report, which lists subscribers by ID, Source Code, Last Name, Company, Type, Payments, Balance, and Last Update, presenting totals on the payments and balance fields.

Invoicing/Renewals

Once a subscriber's record has been entered and the subscription has been paid, the subscriber will, when nearing the end of the subscription period, be sent either a renewal or a "bill me" notice, which begins a billing cycle for subscriptions requested but not yet paid for.

Publiphile will automatically generate the invoices for renewals or "bill me" notices. The invoices provide ample space for special messages to be displayed and are generated according to the date field. This allows the invoices to be generated in cycles. For example, the first invoice will have a simple message such as "This amount now due." After 30 days, an invoice with a stronger message would be sent. After 60 days a final notice would be sent, and if no payment is received, the subscription would be canceled.

Such reporting and invoicing capabilities are the heart of a circulation management system. Combined with the accounting capabilities and the flexible nature of *dBASE II*, *Publiphile* offers a full-featured circulation file management system for use on the IBM PC. ■

Terry Ulick is editor and publisher of Professional Publishing Magazine, *which explores the use of technology in publishing environments, and of* MagazineMICRO, *a newsletter that details publishing models for microcomputers.*

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Pascal Times Four

A comparative review of four major Pascal compilers: IBM/Microsoft Pascal, Digital Research's Pascal/MT+86, Software Building Blocks' SBB Pascal, and Borland International's Turbo Pascal. *Tech Journal* reviewers judge each compiler by ten criteria: documentation, ease of use, compilation speed, output code speed, output code efficiency, extensions to the ISO Standard, program fragmentation, file I/O, real number handling, and low-level machine hooks.

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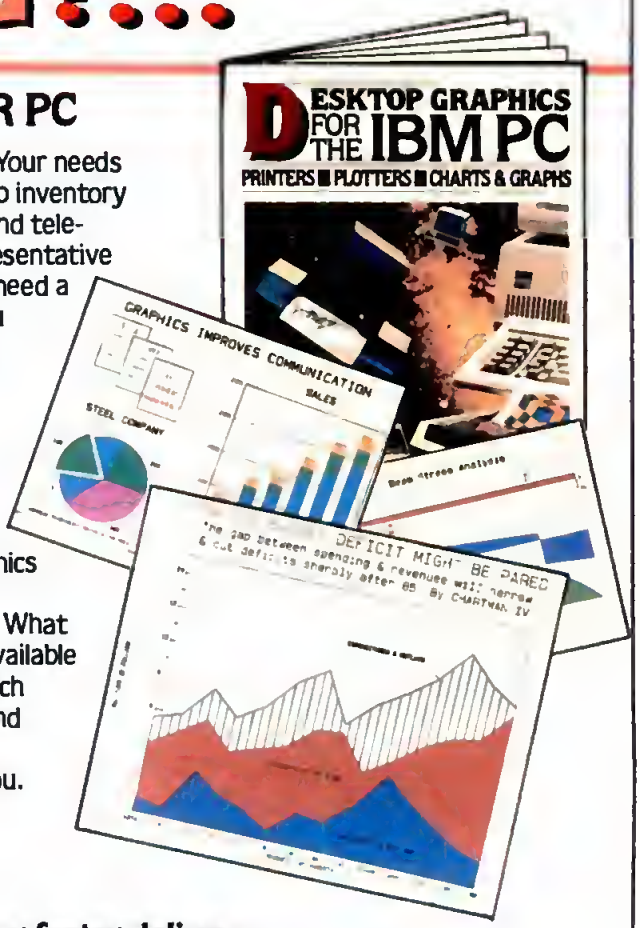

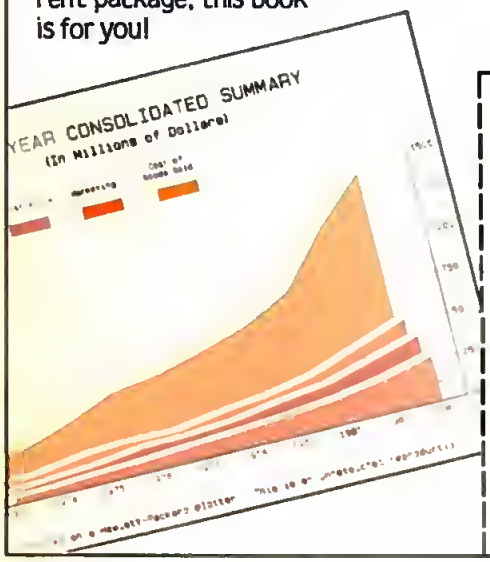

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Jig Jags 2

Like most people, you probably enjoy the challenge of crossword puzzles, but those cryptic clues drive you crazy. For a change of pace, you might turn to a jigsaw puzzle. It is supposed to be a relaxing diversion, but if you've lost that one little piece that goes near the upper right-hand corner, you ruin the whole effect. The drawbacks of crossword puzzles and jigsaw puzzles have been eliminated in a new game: *Jig Jags*, the combination crossword-jigsaw puzzle. Arrange the 16 puzzle pieces on the 7×7 square grid to form a valid crossword puzzle. This issue contains three new puzzles for a refreshing break from those other nerve-wracking pastimes.

Directory Reader

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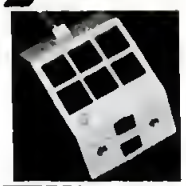

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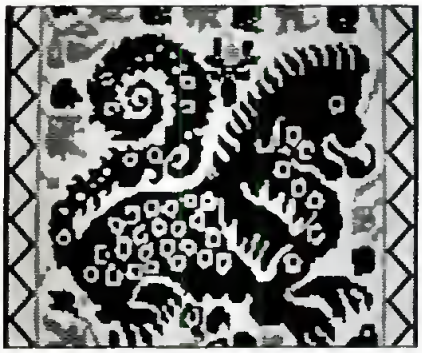

Computer-Aided Needlepoint (CAN)

Did you ever wish you could design needlepoint patterns with the aid of your PC? Now you CAN, with computer-aided needlepoint software and an IBM PC. Two plastic surgeons on the faculty of Case Western University School of Medicine report on how they transferred needlepoint designs onto the PC screen, and vice versa.

Computer-Aided Design

Just as you can use word processors to create and edit hard copy, CAD software allows you to create and edit abstract designs, diagrams, and logos; some CAD packages even create three-dimensional images. *PC* reviews four of these programs: *AUTOCAD, VERSACAD, DRAWING PROCESSOR,* and *CADPLAN.* We'll look at their uses, pros, and cons.

DBMS: Part 4

PC's series on database management packages moves on to its second stage, relational databases. These second level packages allow you to use information from two or more files at the same time and have a query language for extracting information from the database using select criteria.

JACK2

This integrated software package with word processing, database management, spreadsheet, and graphics capabilities has pitted itself in its recent promotions against the likes of Lotus' *1-2-3,* and the Lisa system. Does *Jack2* really meet the challenge? We'll show you in what ways it does—and doesn't.

Envision VectorPrinter

A look at a do-everything printer that can shift from high-speed dot matrix to near letter quality, from multicolor graphics to multipen plotting for creating charts, graphs, and transparancies. The Envision VectorPrinter 430 can do all this because it comes complete with its own microcomputer. Does its versatility make this printer jack-of-all-trades, but master-of-none, or is the whole greater than the sum of the parts?

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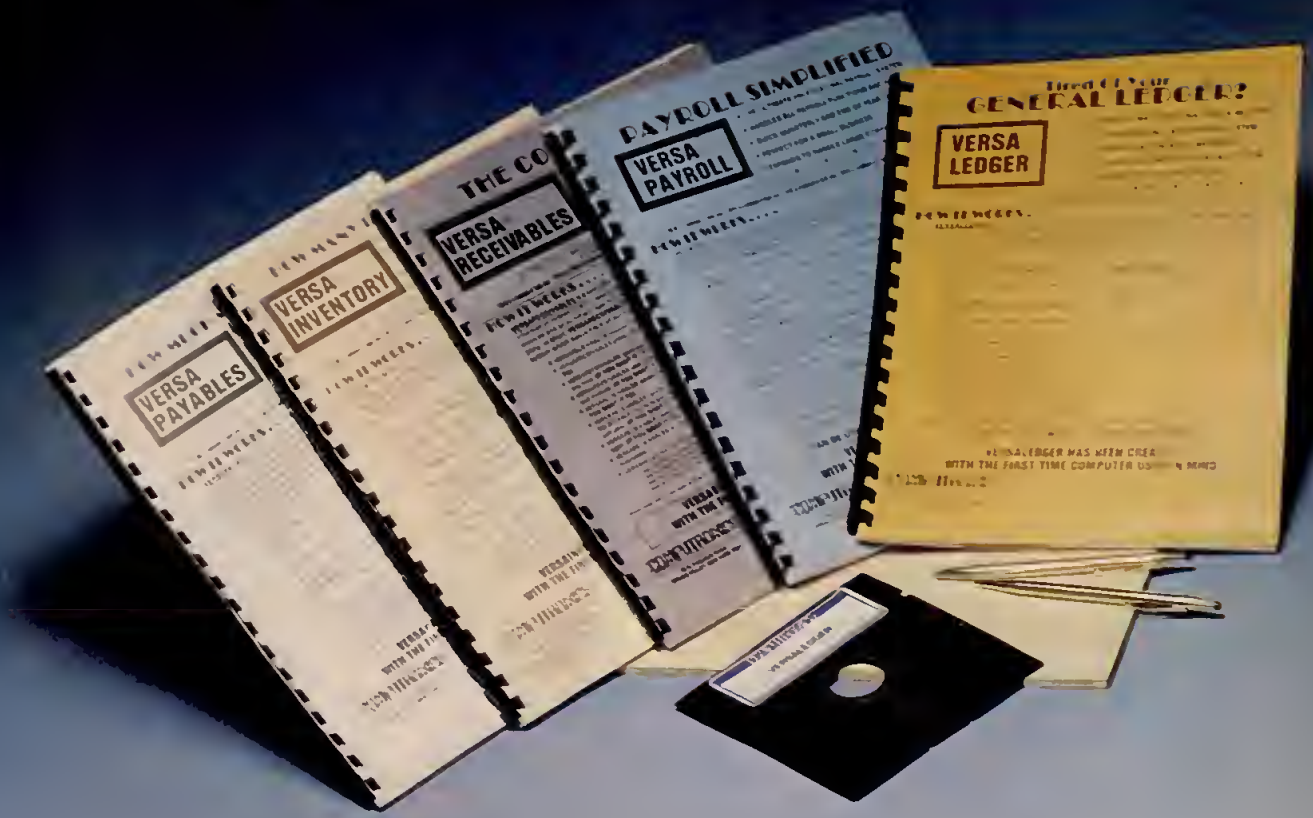

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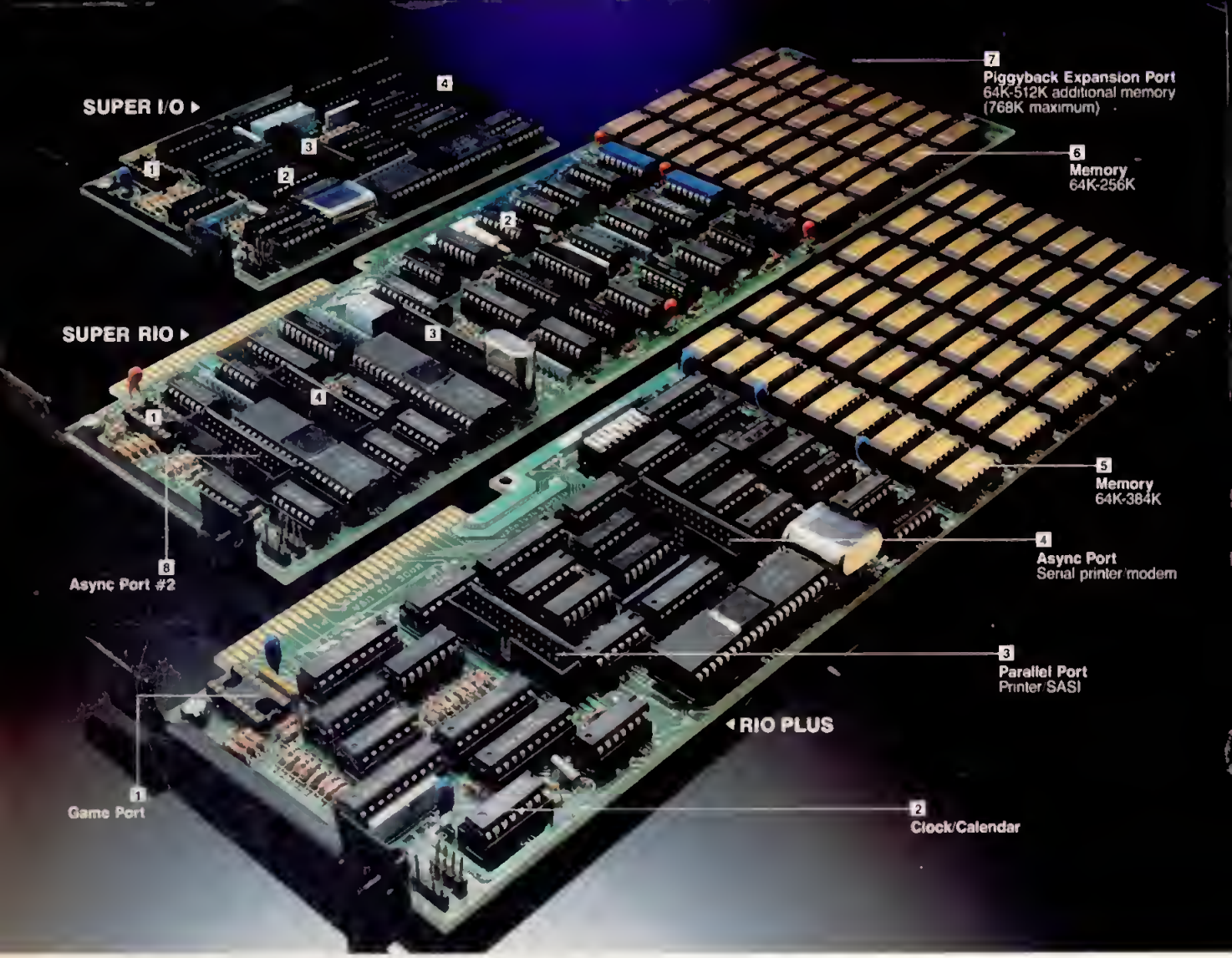

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